IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication AUGUST 25, 1960

Lawrence S. Williams

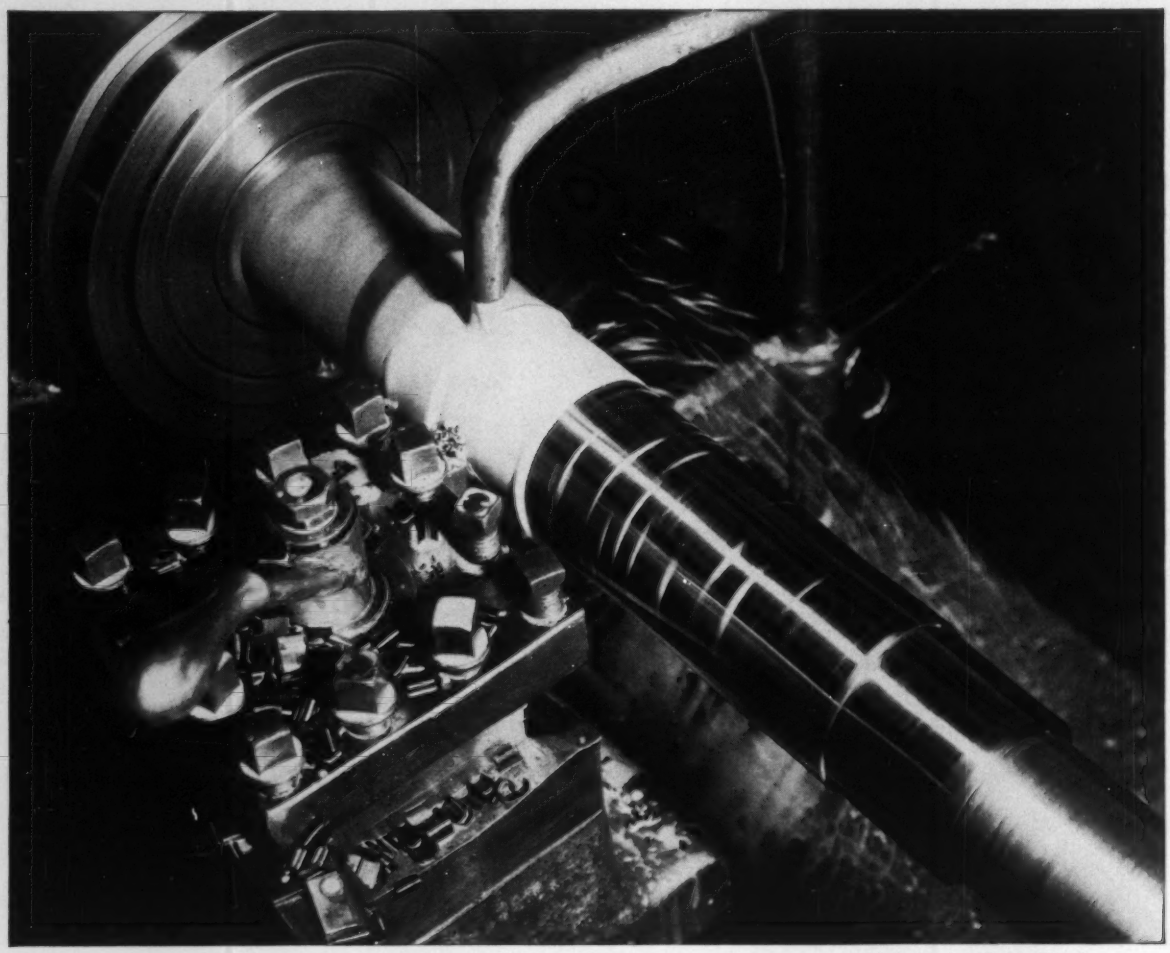
★ Special Report to Management:

How to Get More From Special Fasteners p. 83

Business: How Serious a Drop? p. 47

Oxygen: A Big New Industry p. 52

Digest of the Week p. 2-3



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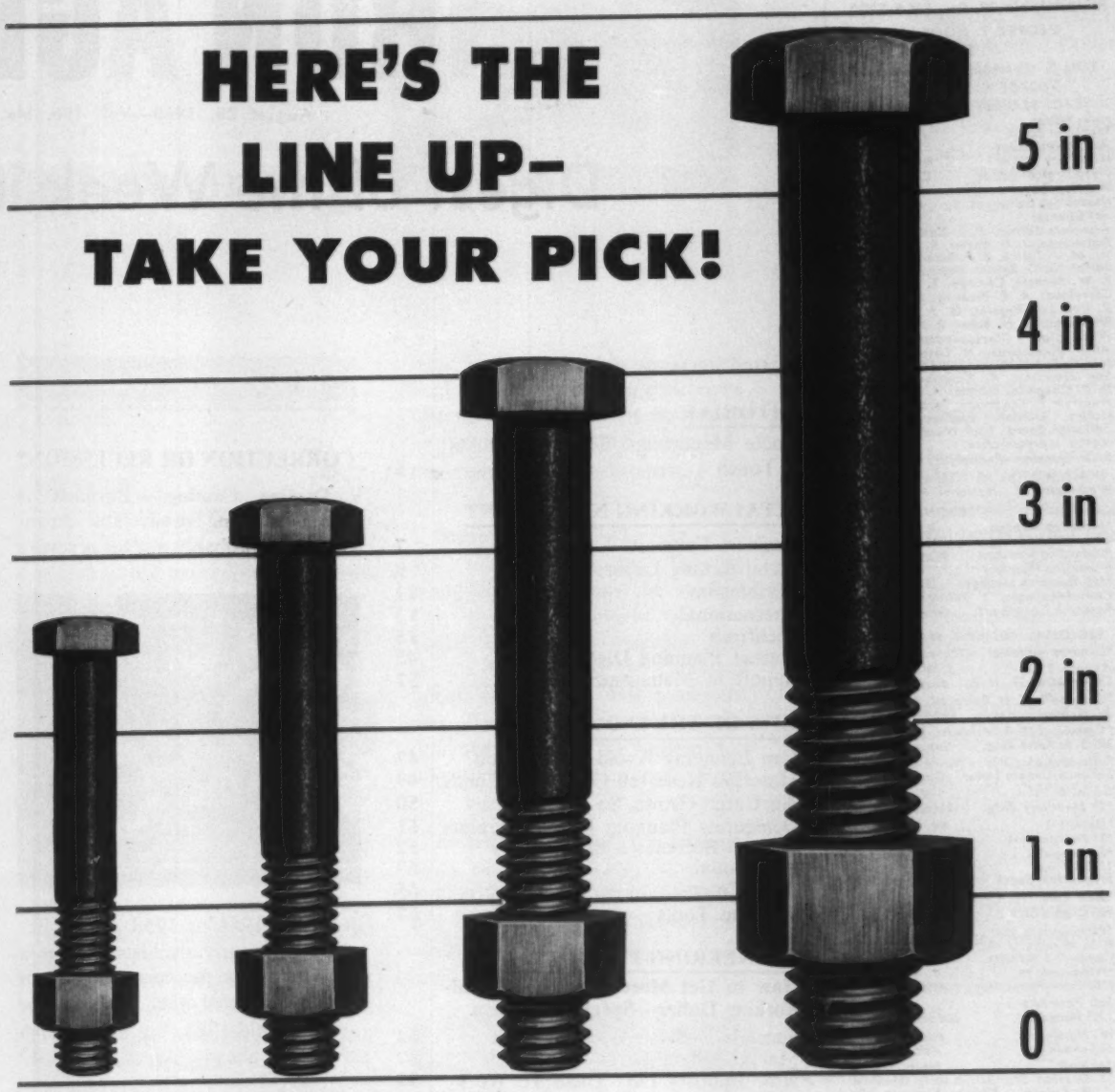

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The IRON AGE

August 25, 1960—Vol. 186, No. 8

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News of the Industry

CORRECTION OR RECESSION?

Decline Coming — Business is now correcting itself. The downtrend will probably not be as severe

as either 1954 or 1958 cycles. Because the early declines are in a few industries, the correction is not widely apparent yet. It should be over by mid-1961, but some tough times are ahead. P. 47

MATERIALS RESEARCH

More Government Funds—Through grants of almost $14 million to three universities, the U. S. is encouraging more materials research. Additional schools will be added to the program later. P. 49

AIR CARGO

Fleet Expansions—Aviation men are looking at the next five years to bring expansion in air cargo. Lower rates and additional space

Metalworking

Cover Feature

RAPID ASSEMBLY — Spend your "Special Fastener Dollar" wisely and you'll reduce assembly costs. The Philco Corp., Philadelphia, uses special fasteners to speed assembly of radio and television components. P. 83

will mean more customers. But expansion means a revision of ground facilities. P. 50

OXYGEN

New Industrial Giant — Oxygen is fast becoming a big industry as industrial use multiples. In next two years, supplies available for steel industry will double. P. 52

Engineering-Production Developments

HOW TO GET MORE FROM SPECIAL FASTENERS

Reduce Assembly Costs—If you turn out items in heavy quantity or if you build a quality product, then you're a prospect for special fasteners. Bear in mind that it's assembled cost that counts. Special fasteners aid the mass producer. They reduce assembly costs and create new designs. P. 84

Match to Job—Many types of special fasteners are available. The selection literally runs into the millions. Selection of the proper fastener to suit your needs is no simple matter. If you can't find the desired fastener on the market, there are manufacturers who will make it for you. P. 87

Practical Use—There's no limit to the potential of special fasteners. Industry puts the specials to work in multifarious applications. By noting some of the present industrial uses, you can develop many practical ideas for your own operations. Old troubles are rapidly disappearing from the assembly scene. Give the credit to special fasteners. P. 92

Sensible Buying—To get what you want from a new fastener, many conditions must be studied. Use a simple checklist as your guide. Unnecessary fastener frills should be trimmed by combined talents of both the maker and the user. If a fastener must be custom-designed, try not to impose too many limits on the designer. P. 96

Faster Production—Top management would like to see more automation in long fastening lines. It can be done. Special fasteners are adaptable to power tools. P. 98

Market and Price Trends

ADMINISTERED PRICES

Government Guidance? — The new leaders of the Democratic party are committed to a policy calling for action against industries accused of "administered price" activities. It's a plank in the platform. P. 51

AUTOMOTIVE

Advice to Giants — American Motors' president predicts that Ford and Chevy will have to become compact cars by 1963 or lose their traditional sales leadership. P. 59

WEST COAST

New Markets—Natural gas industry facilities are growing at a rate of $2 billion annually. This means additional new markets for metalworkers. P. 65

STEEL SUMMARY

Price Outlook—Unless there is a sharp change in steel orders, price increases this year are not likely. Feeling is the market won't support an increase. P. 125

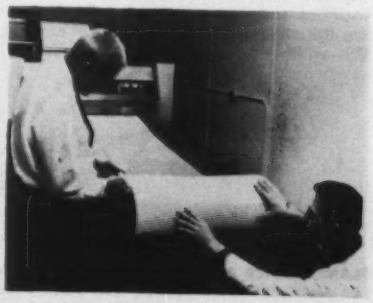
PURCHASING

Office Furniture — Buyers are turning more to modular units. But there are some cautions worth noting in making a selection. P. 124

NEXT WEEK

FOLDED METALS

A New Twist—Problems in corrugating metal have been overcome by a recent technical development. New, larger size capabilities and increased flexibility assure a variety of patterns which can be tailored to your particular needs.



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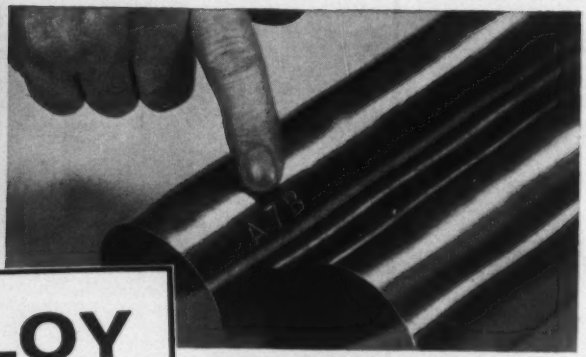

8-STEP CERTIFICATION—Our unique 8-Step Certified Alloy Plan assures test-proven quality and predictable performance every time . . . guides heat-treatment . . . cuts reject loss.

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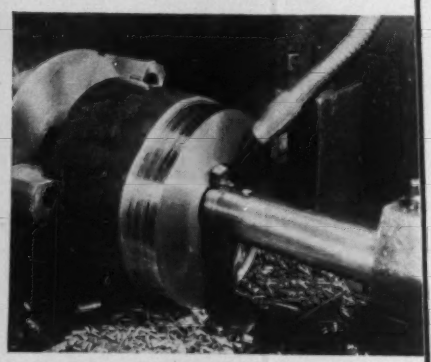
	8620
	8620 leaded
	E9310
	Nitralloy
	135 modified
Heat-Treated Medium Carbon	4140
	4140 TG & P
	4140 leaded
	4147/50 leaded
	4340
	Rycrome®
	Rycrome TG & P
	Nikrome®
	Nitralloy
Medium Carbon Annealed Direct Hardening	4140
	4140 leaded
	4147
	4147/50 leaded
	4340
	E6150
	8647 leaded
Rycut Free Machining	Rycut® 20
	Rycut 40 and 50 annealed
	Rycut 50 modified annealed
	Rycut Heat-Treated

PLATES

8620	T-1
E8615	Aircraft Quality
4140	4130 & E4130



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DEPENDABLE DELIVERY—Big-capacity facilities and an experienced staff with a service attitude assure quick delivery of any quantity—within hours if needed.

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Uncle Moneybags: The World's Soft Touch

It may be time for us to review what we are trying to do around the world. It is true that if objectivity and brains are used on this problem we will be accused of being mercenary.

But maybe Uncle Sam ought to be a little more mercenary than he is—or has been. This hard-bitten world with its crises, its problems and its age-old challenges, will never be a social-worker's dream.

There are some problems that perhaps have no solution. Or, if they do have a solution, it is far in the future. Scads of millions of dollars will not hasten the "great day" too much.

The mess in the Congo may be the fault of any number of people—or nations. But the fact remains that we are in Congo up to our necks.

We are told we have to watch the Reds to see that they do not get the upper hand in the new nations of Africa. That, we are told, would be fatal. Maybe it would and maybe it wouldn't.

The major point is that the United Nations, through its Secretary General, is going to spend hundreds of millions of dollars in the Congo. It also will send technicians, clerks, supervisors, and what-have-you to the Congo to carry out the plan approved by the UN. What is being done may be right. But even right things can be done wrong—or produce weird results.

Every time one raises a question as to how far the United States can go with its help, he is accused of being parochial. Maybe some of those critics are narrow-minded in the sense that they don't see the Big Picture. But there are millions of Americans today who are wondering just what we intend to get or accomplish with a global give-away program that often looks questionable.

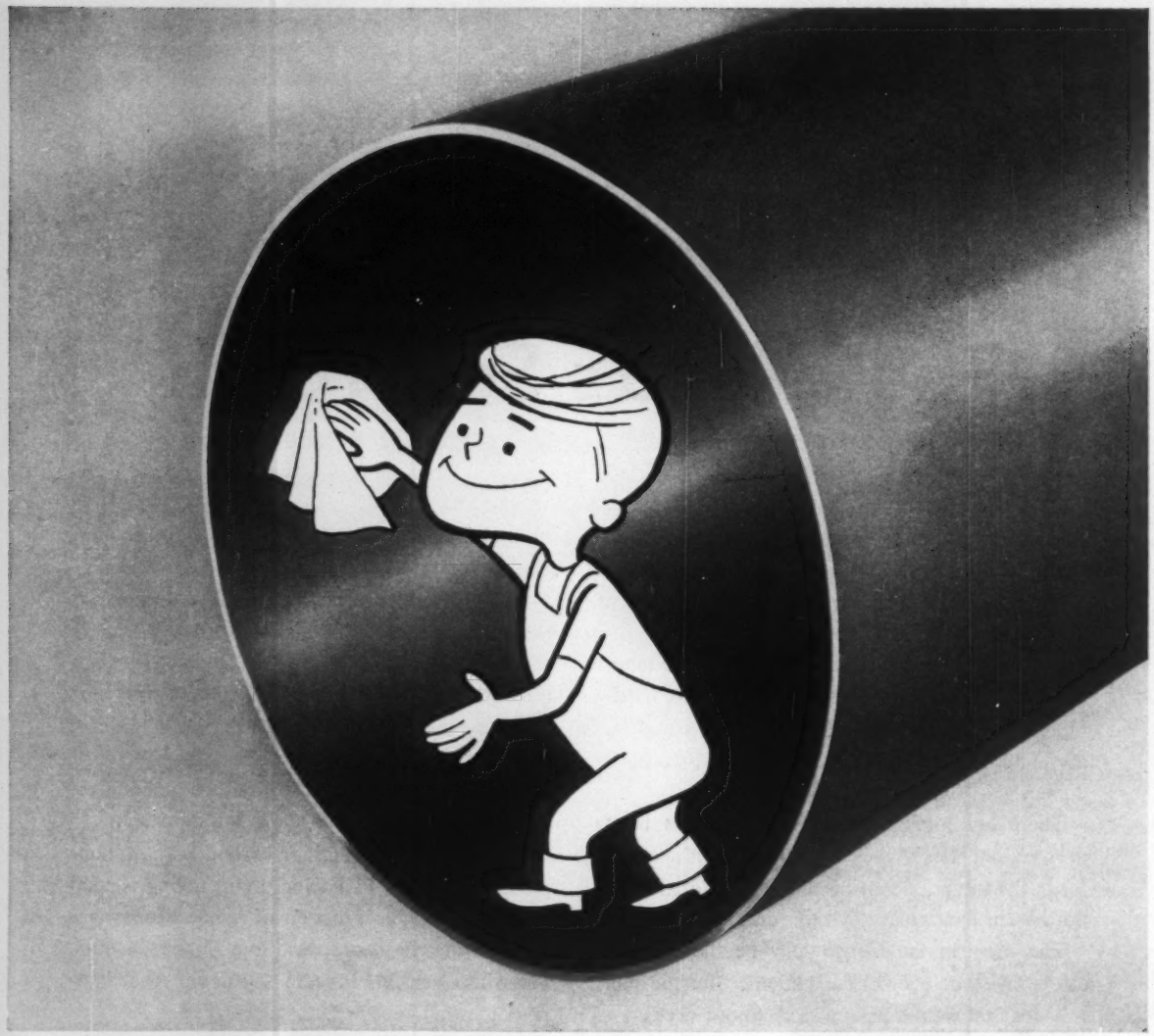
There would be nothing wrong with a non-partisan, civilian, taxpaying group taking a good look at the whole program of Uncle Moneybags —an Uncle who is supposed to give until it hurts, but who often has little to say about what happens to what he gives.

Uncle Sam is still the softest touch in the world. Some of the touches have been quite large. Some have produced great advances for the Free World. But some have built up nations which later gave us and our allies the cold shoulder. Still others have produced little or nothing.

Without seeming to be tough, unkind, narrow-minded, immature, or prejudiced, it seems to be about time to find out where we are going. Certainly it won't hurt to re-appraise our goals.

Tom Campbell

Editor-in-Chief



"The Gravity Kid" shows how

YOU CAN STOP CONTAMINATION WITH THE HELP OF CONTOUR-WELDED STAINLESS TUBING

In tubing, surfaces that are microscopically rough and ragged can cause contamination—simply because of the product becoming incrustated. Contour-welded tubing helps lick this problem because it's smoother inside than any other tubing, welded or seamless.

This smooth surface is the result of Contour-welding, a patented* process that eliminates the weld bead. Unlike conventionally-welded tubing, it's welded at the bottom. Gravity pulls the molten metal down so that the weld area corresponds to the inside contour of the tube. There's no bulge on the inside surface. Even on the outside, the seam closely conforms to the tubing shape.

In conventionally-welded tubing, gravity pulls the molten metal down into the tube, forming a bead that is difficult to remove by cold working. And cold working can lead to undercuts that become focal points for incrustation.

Even seamless tubing isn't as smooth as Contour-welded tubing. That's because it's extruded or pierced, whereas Contour-welded tubing is formed from uniformly rolled strip steel.

But see for yourself. Write today for our free 48-page manual, which describes sizes from 1/8″ to 40″ O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy, and Hastelloy**.

* U.S. Patent 2,716,692

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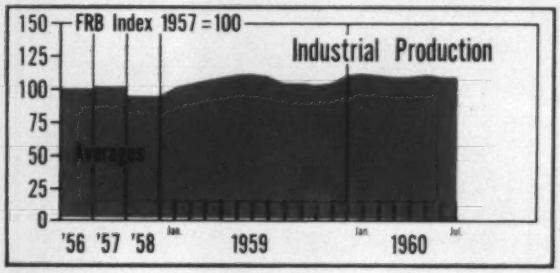
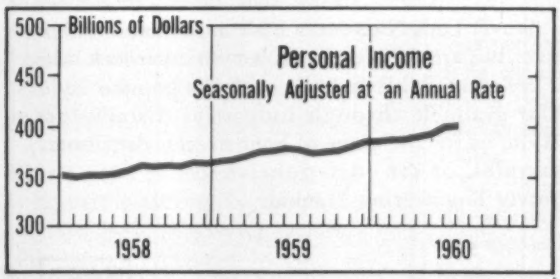


Production Shows Summer Doldrums

Industry marked time in July as the Federal Reserve Board's Index of Industrial Production held steady at 109. What the July figure represents is an absence of trends in any direction, and a continuing of the summer slump in durables. Little change is expected in August but the test will come in September when the rate must show at least seasonal improvement to hold steady.

FRB Moved Before Trouble

Recent moves of the Federal Reserve Board to expand the money supply are not likely to affect the immediate business picture. But they could help avoid a serious recession and aid in a good recovery in 1961. The important thing is they were taken in advance of real trouble. The actions: Two cuts of one-half of one pct in the discount rate; a cut in stock market margins from 90 to 70 pct; and an increase of some $3.5 billion in lending power of the nation's banks.



Personal Income at Record High

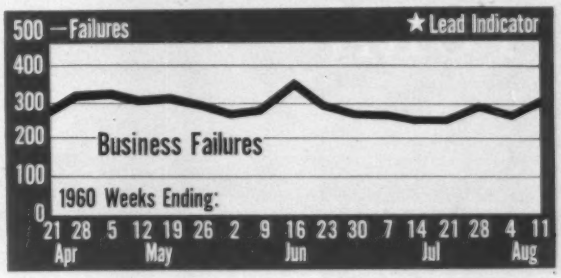
The declines in some areas of the economy have not yet affected personal income. Income in July hit a record annual rate of $407.1 billion, up $1 billion from June. However, the rate of gain was smaller than the previous month and indicates a leveling off from earlier gains this year.

Inventories: An Added Problem?

Most business talk about inventories is related to steel. But it goes deeper than that. Although most larger companies have their inventories under control, there are many more that will be staying out of the market for important parts and products for many weeks. Generally speaking, inventory control is still an active factor in metalworking markets.

New Home Outlook Not Encouraging

New home construction is expected to get going next spring. But there is no cheer in the immediate outlook. July housing starts dropped 10 pct from June to the comparatively low annual rate of 1,173,000. It's the lowest since March. Furthermore, the number of FHA applications is also discouraging. The July rate held at the June level of 241,000, seasonally adjusted annual rate.



Failures Highest in Seven Weeks

Business failures, always considered a "lead" indicator, begin to reflect the uncertainty creeping into the economy. Failures for the week ending Aug. 11 totaled 308, according to source Dun & Bradstreet. This is the highest in seven weeks. Most of the increase is accounted for by retail failures.

More Leasing in Major Industry

Leasing arrangements are being considered in the steel industry and other major manufacturers. This is as a means of making up for a shortage of capital dollars. Leases are suggested as a means of financing utility facilities. These offer a low return on investment, but are necessary to support capital programs. They give the company an opportunity to add a major facility, but without difficult financing.

THE STOVER LOCK NUT FAMILY CLAMPS DOWN ON COSTS AT EVERY TURN

Stover Automation Lock Nut, Grade B, for use with low carbon and medium carbon heat treated bolts and studs (SAE 2, 3, 5). Stocked in bulk containers and standard packages by authorized industrial distributors.

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Stover Lock Nuts cost a little more than common nuts, but are very competitive with other lock nuts. They're available in bulk, with the popular styles also available through industrial distributors. Write us for the name of your nearest distributor, samples, or the just-published Stover Engineering Manual.

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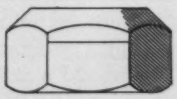
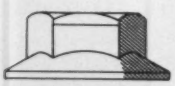
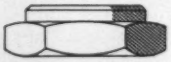


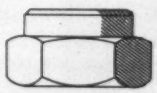
Automation
¼"—1"
A basic nut for general use.



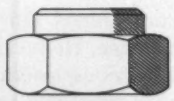
Flange
#8—½"
For clamping soft and/or thin materials.



Thin Hex Collar
¼"—1½"
Used where space is a problem, such as on pinion and pulley shafts.



Hex Collar
⅞"—2"
Lower on-torque in the larger sizes than Automation style.



Heavy Hex Collar
⅞"—2"
Used where greater bearing surface is needed than available with Hex Collar style.

MEANY: Who's his choice?

AFL-CIO: $600,000 Fund To Get Out the Vote

A $600,000 "non-partisan" fund to get out the vote is the first move by the AFL-CIO in the upcoming Presidential campaign.

And, at the same time, the union still withholds its announcement of its choice between Sen. John F. Kennedy and Vice President Nixon. But AFL-CIO president George Meany says he expects the general board to name its candidate when it meets in Washington this week (Aug. 26).

Of course, no one has any doubt of the union's choice, although Sen. Kennedy may not get the wholehearted rank-and-file backing that other Democratic candidates have in the past.

Two factors give the Vice President hope of stronger support. One is his part in settling the steel strike. Another is the carry-over of favorable union sentiment to Sec. of Labor Mitchell.

Going back to the "non-partisan" fund, it will be aimed at union members, who Mr. Meany expects will follow three out of four the leadership's endorsement. Even while saying that, Mr. Meany concedes no labor leader can say he controls votes of his members.

Goldberg's Plan For Presidential Counsel

Arthur J. Goldberg, general counsel of the Unitel Steelworkers, has produced his own plan for an advisory group for the President on labor problems.

In a Chicago speech last week, Mr. Goldberg suggested a tripartite group representing labor, management, and the public, to advise and make recommendations to the next president.

The Steelworker counsel and legal advisor says the group should not interfere with normal, established collective bargaining. It would "bring the experience and wisdom of labor, management, and public experts in the field to the great problems posed to labor, management, and the country, by the cold war and automation."

On Paper Only, Steel Workweek Gained

By a statistical oddity, hours worked in the primary metals industry increased in July. This is in spite of the severe cutbacks in the steel industry.

How did it happen? Many steelworkers who were on short time were on vacations during July. As a result, they were paid on a 40-hour basis. So, the weekly hours actually gained .3 hours in Dept. of Labor statistics.

Although the factory workweek dropped .2 hours to 39.8 during the month, the decline was seasonal and adjusted figures show no change at 39.9.

With fewer vacations in August, hours worked may drop, statistically, even though more men may be working more hours.

Teamsters: Aim at Auto Salesmen

Auto salesmen have become a prime organization target of Teamster president James R. Hoffa as the giant union goes after a goal of 2 million members. Present membership is 1.6 million.

The union rates its first meeting to organize 3000 Detroit area auto salesmen as successful. More than 200 salesmen attended, 142 signed application blanks.

Here's the 4 point program: Adequate base pay and $75 or a 4-pct commission for sale of each car; guarantee of reasonable working hours no longer than 44 hours a week; hiring of only registered and licensed salesmen; fringe benefits such as paid vacations, health and welfare insurance programs.

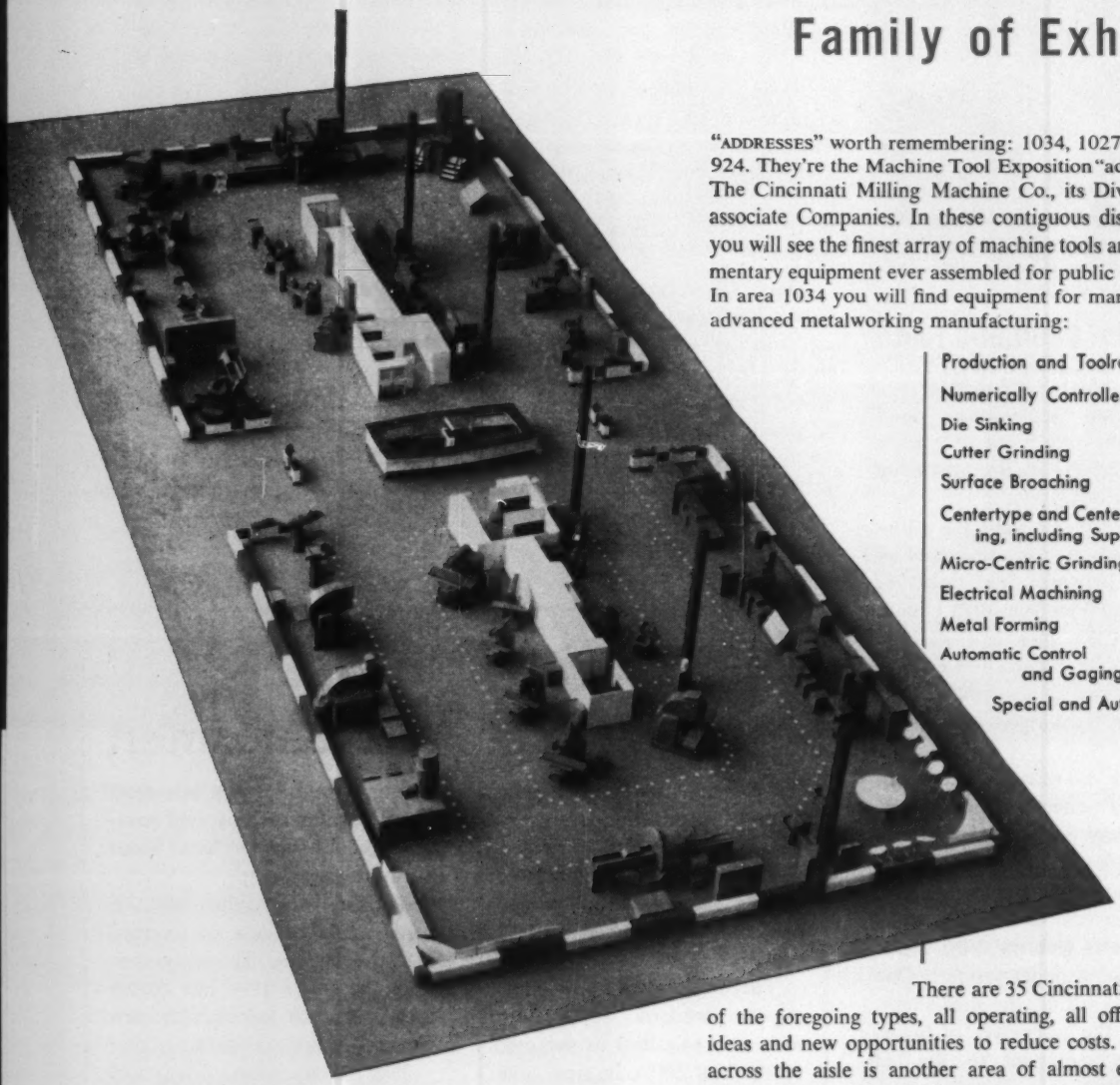
Teamsters say the drive is being made because of requests of the salesmen. The only contract the union now has covers factory branch salesmen in one General Motors division.

The organization drive will take place only in Detroit, for the time being. Six years ago a similar drive failed. The union says the drive failed because at that time the National Labor Relations Board was involved in a jurisdictional conflict with state labor boards.

CINCINNATI

The Most Rewarding Visit in Your Exposition Tour

. . . the CINCINNATI MILLING Family of Exhibits



"ADDRESSES" worth remembering: 1034, 1027, 934, 928, 924. They're the Machine Tool Exposition "addresses" of The Cincinnati Milling Machine Co., its Divisions and associate Companies. In these contiguous display areas you will see the finest array of machine tools and complementary equipment ever assembled for public inspection. In area 1034 you will find equipment for many types of advanced metalworking manufacturing:

- Production and Toolroom Milling
- Numerically Controlled Machines
- Die Sinking
- Cutter Grinding
- Surface Broaching
- Centertype and Centerless Grinding, including Super Precision
- Micro-Centric Grinding
- Electrical Machining
- Metal Forming
- Automatic Control and Gaging Equipment
- Special and Automated Machines

There are 35 Cincinnati machines of the foregoing types, all operating, all offering new ideas and new opportunities to reduce costs. And right across the aisle is another area of almost equal size, containing operating exhibits of two Cincinnati Milling Divisions and two associate Companies. Truly these Cincinnati exhibits reveal the finest in metalworking progress. Be sure to reserve plenty of time for a thorough inspection of all of them. **The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**

MODERN MACHINE TOOLS MMT-PE PRODUCTION EFFICIENCY

CINCINNATI®

By R. W. Crosby

What Mobile Army Means

Industries selling to the U. S. Army had better heed MOMAR.

MOMAR means MOdern Mobile ARmy. It's the Army's answer to critics who say it has a dim future in this nuclear age.

Says one general, there is no realism to the views of those who "see the future of the Army as limited to a sort of fire brigade designed specifically to put out brush fires."

To Army contractors MOMAR means more defense spending in the future.

Under the new concept, the Army plans to have 100 pct vehicular mobility, ground or air, for all combat and combat support units.

The Army's plan for modernization calls for more trucks, more tanks, more planes. It calls for more automatic weapons and more automation in general.

For the metalworking industries, it means more metal for swift yet heavily-armored tanks, modern armored artillery and armor-protected personnel carrier vehicles.

The Army is hoping to spend as much as $3 billion a year on modernization. This is over and above their current $8 billion or $9 billion annual spending. Industry is bound to benefit.

Army planners hope to realize MOMAR in this decade. Since it will be a decade of spiraling defense spending, they probably will make it.

New Tax Law Coming?

The Internal Revenue Service's adoption of tougher income tax regulations to reduce expense account tax deductions by businessmen may be backed up by legislation next year.

Both Presidential candidates, Kennedy and Nixon, agree the law should be changed. To be hit by new law and regulations: Excessive deductions for entertainment and failure of taxpayers to report expense account allowances and vacations as income.

Will Higher Minimum Hit Metalworking?

Outwardly, few metalworking companies will feel an immediate impact when and if the minimum wage goes up. Even at $1.25, as pushed by Sen. Kennedy, most companies in the field pay well over that figure for any job.

But wage adjustments have a way of spreading. If any group gets a government-forced raise, a differential is narrowed somewhere and pressures to restore it start immediately.

And the costs of some products

KENNEDY: For $1.25

and many services will go up with a higher minimum. While few people in metalworking will quarrel with the wage itself, upward pressures are the inevitable result.

Bigger Defense Spending

The Defense Dept. is already planning increased military spending for next year.

Defense Secretary Thomas S. Gates met with the chiefs of America's world wide military commands last week. The meeting came in the midst of Pentagon planning of the military budget which will be sent to Congress next January.

The commanders discussed measures for increasing the readiness of their forces and the money it would take to do it. Plans are expected to send the defense budget over the $41.5 billion for the fiscal year that started July 1.

Democrats Hit Unspent Funds

Democrats continue to make much of the "unspent" extra money Congress voted for defense. Now, Rep. Daniel J. Flood, D., Pa., has introduced a bill to label failure to spend the funds "contrary to the interest of the national defense and a dereliction of duty."

His bill is aimed at President Eisenhower and Sec. of Defense Thomas S. Gates. He wants to make it "the sense of the Congress" that the extra $750 million be spent as intended. The bill says the money was intended for:

"Necessary Army modernization, the construction of Polaris missile submarines and attack submarines, the faster development of the B-70 Air Force bomber, the provision of spare parts and practice for airborne alerts, and the speeded-up development of the Samos spy-in-space satellite."

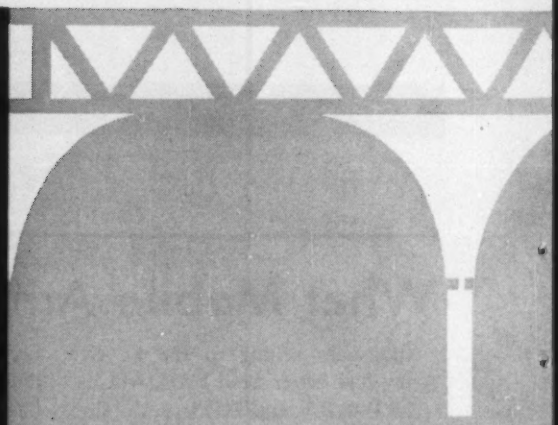
Flood seems to be jumping on Ike's bandwagon. These are the very items for which the President said he expected to get adequate funds. Their only difference seems to be how much is "adequate."

prediction

NEVER BEFORE

SO MANY TREND-SETTING

DEVELOPMENTS



NEW DEVELOPMENTS IN AUTOMATED STEELMAKING

●

ADVANCED EQUIPMENT NOT EXHIBITED PUBLICLY BEFORE

●

NEW OXYGEN PROCESSES — INCLUDING AJAX, L-D, ROTOR AND KALDO

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REPORT ON SOVIET FERROUS METALLURGY

●

NEW PROCESS FOR CHANGING STEEL CHEMISTRY THROUGH OPERATING PRACTICE

●

NEW TECHNIQUES IN INCREASING BLAST FURNACE OUTPUT THROUGH ELEVATING TEMPERATURES

●

COMPLETELY AUTOMATED ROLLING MILL

●

NEW BULK GREASE-HANDLING SYSTEM

●

NEW FURNACE DESIGNS

●

OTHER NEW DEVELOPMENTS IN COMBUSTION . . . ELECTRICAL . . . SAFETY . . . ROLLING MILL . . . AUTOMATIC CONTROL . . . AND MECHANICAL PRACTICES

BE ONE OF 15,000 WHO WILL ATTEND to see and hear discussed the many advanced developments of today that will be standard operating practice in the future. Four full days of technical sessions (42 in all) will be held concurrently with AISE's largest Exposition (206 exhibitors, 15% more area than the largest previous show).

No man concerned with steelmaking or plant maintenance can afford to miss this opportunity of reviewing *the new, the technical, the significant!*

1960 IRON AND STEEL CONVENTION AND EXPOSITION

Sponsored by Association of Iron and Steel Engineers, 1010 Empire Building—Pittsburgh

SEPTEMBER 27-28-29-30, 1960 • CLEVELAND PUBLIC AUDITORIUM

French Say U. S. "Not Export-Minded"

It should come as no surprise to U. S. businessmen who are just waking up to export possibilities, but French businessmen conclude that U. S. businessmen are "not export minded."

This is a conclusion of a survey of export possibilities in France conducted by the U. S. embassy in Paris, in connection with the National Export Expansion Program.

The heads of 14 trade associations and a broad segment of businessmen were interviewed in the survey.

The U. S. businessman's failure to be export minded is attributed to the lush years of the postwar period when U. S. manufacturers had a seller's market at home and abroad.

One major point: Although U. S. products have a good reputation, many of them appear too late on the European market because of poorly timed promotional efforts.

Latin American "Togetherness"

It may be late in the game, but the U. S. is making some headway in understanding the complex problems of Latin America as they relate to the U. S.

A re-shuffling of some State Dept. people has started. But a lot more will have to be done if the U. S. is not to be put into a far more defensive position than it is now.

The Castro government is alert to capitalize on a Latin American "togetherness" angle.

To counteract the anti-U. S. movement, Washington has called on some industry veterans in Latin American dealings. But, some believe not enough attention is paid to their observations. There is a lot of feeling that the government has to listen to experience if it is to make any progressive moves to reverse the growing anti-U. S. sentiment.

Romney Goes After World Auto Markets

The world auto markets aren't yet closed to U. S. manufacturers, at least in the opinion of American Motors' George Romney.

AM's president says his company will export 6000 Ramblers in 1960, not including sales to Canada. He says exports will climb faster than domestic sales in the next few years.

"We're thinking in terms of world markets like never before,"

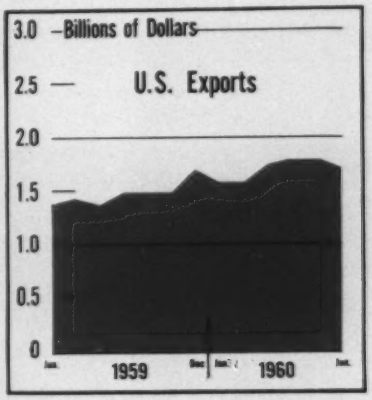
ROMNEY: Exports will climb.

he says. "Recently we completed a deal to build Ramblers in Malta. We're on the verge of following this up with production facilities in Australia."

Incidentally, Mr. Romney predicts that imports of foreign cars this year will be down to 400,000, from 668,000 in 1959.

Exports Dip

After nine months of slow but steady climb, exports from the U. S. dropped off in June from the preceding month. June exports, including re-exports, totaled $1,717 million compared with $1,791 million in May.



There was no outstanding regional drop as declines were noted in Western European, Canada and Latin American nations.

However, the rate of export is still well above a year ago. Exports for June, 1959 totaled $1,422 million. Monthly average for 1959 was $1,463 million.

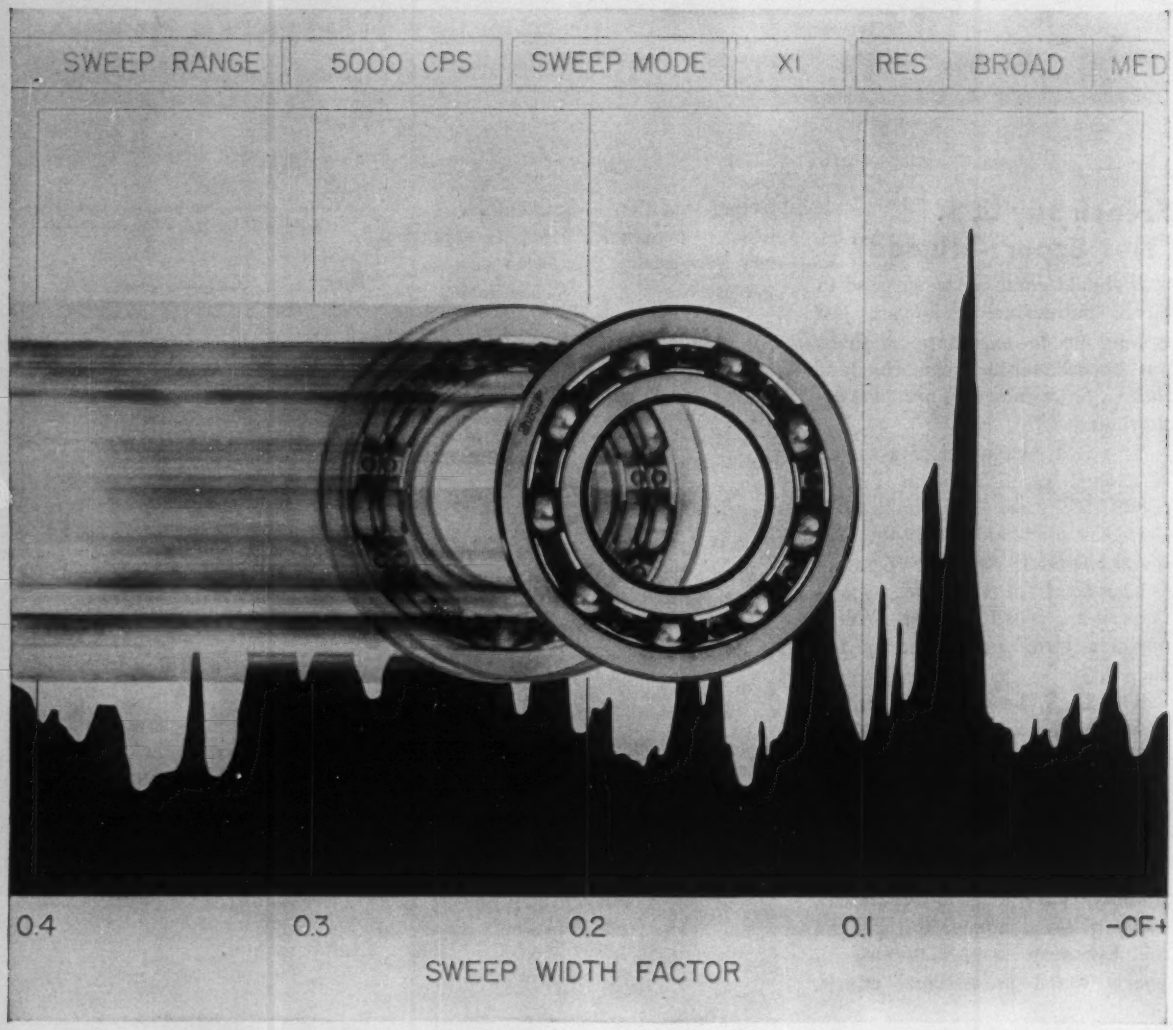
Europe Tools Up

Europe's booming industry has brought a pickup in export orders to U. S. machine tool builders. One cause: European builders of the more sophisticated machines are now quoting 18 to 20 months' delivery. While such orders are firm, it's the kind of business that will be tough to get once Europe is well tooled up.

War Scrap Scouted

Scrap orders from the Japanese would be a great deal higher, if the Pacific area was not full of World War II scrap.

Far East sources report Japanese salvage teams are combing the Pacific, with considerable success, salvaging heavy, high-quality scrap from sunken ships.



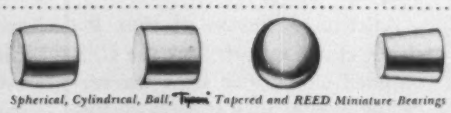
Now, SKF reduces the noise level of ball bearings by 50%!

New SKF ball bearings run twice as quietly as standard single-row deep-groove bearings – six times more quietly than bearings produced just two years ago.

They're designed especially for applications where noise is an important factor. Eight manufacturers, who use-tested them for over a year, now back-up their approvals with repeat orders.

Every bearing meets new, more critical standards. Each type and size meets special requirements for reduced vibration. Every ball meets very low waviness limits. Each cage meets critical standards for smooth, quiet performance.

SKF will make a comparison check of these improved bearings against the bearings you're now using. See for yourself! Just call the SKF branch office nearest you. 6013



Spherical, Cylindrical, Ball, Thrust, Tapered and REED Miniature Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U.S. PAT. OFF.

Coated Sand Aids Foundry

A new resin-coated sand produces high quality shell molds or shell cores. The uniformly coated grains develop high-tensile and hot strengths. The standard melt point for the material is 200°-250°F. A lubricant is added to the sand. This provides easier pattern release.

Process Forms Filters

An unusual filter-production method centers on the extrusion of stainless-steel powders mixed with a binder. The powders are of selected particle size. After extrusion, the shapes are sintered to drive off the binder. This provides particle-to-particle contact. Complex thin-walled filters with 100-pct working areas can be formed.

Ultrasonic Welding of Foil

Ultrasonic seam welders will be added to all foil-making lines at Reynolds Metals Co. One welder, already in operation, produces splices strong enough and thin enough to be run at full speed through laminating and printing machinery. The new units will improve quality and save production time. Foil was formerly spliced with tape.

Atomic Machine Controls

Look for atomic research to come up with new concepts in automatic machine tool controls. Proposed is a radioisotope monitoring device to use backscatter techniques for extending present control of cutting operations. Next step is development of hardware for probe units on specific machine installations. Operators of these units would require no technical training.

Improved Solid Lubricant

When silver sulfide is added to molybdenum disulfide, the load-bearing capacity of the solid lubricant is increased more than 20 times. On iron or steel surfaces the additive decomposes. This produces a layer of iron sulfide which has better lubricating properties than the original metal. The iron-sulfide layer interacts with the lubricant to produce permanent lubrication.

Forms Complete Springs

A major advance in spring forming will be revealed at the Chicago Machine Tool Exposition. The new machine makes complete small springs of types that have, until now, required several machines. Cost savings promise to be substantial.

Protects Against Corrosion

Microcracked chromium, a term applied to chromium plate with a microscopic system of criss-crossing cracks, promises better corrosion protection on electroplated parts. A new procedure which calls for the use of selenic acid in the conventional chromic-acid bath proves it's also economical.

Structural Beams Lock

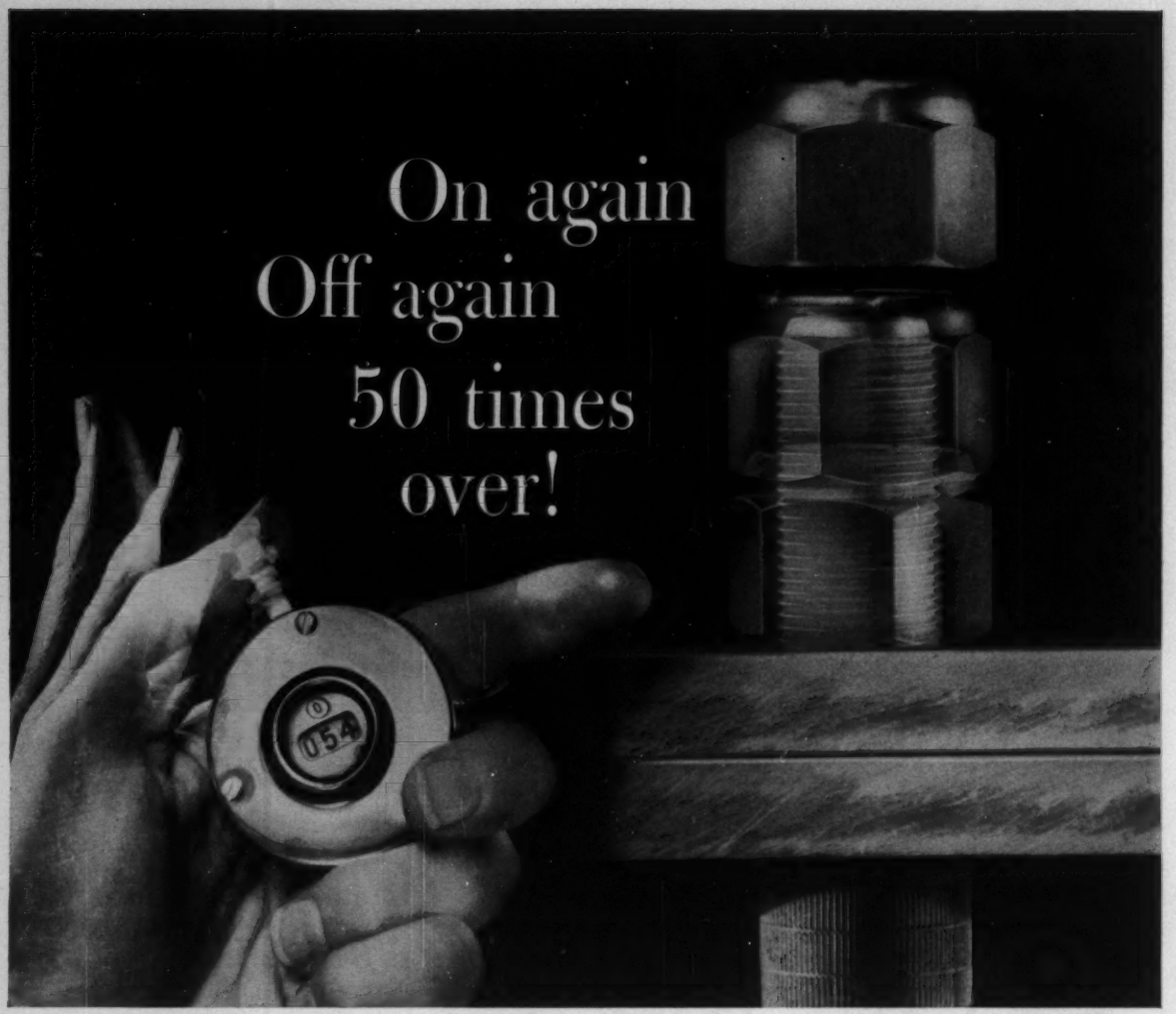
Aluminum sandwich sidewall panels, and a new V-lock structural beam, cut building time on one job from five months to five days. This construction reduces roof loads to about 2½ lb per sq ft. The new locking system needs no bolts, rivets or field welding to aid in fabrication.

More Ductile Ceramic?

A new ceramic, developed by the Avco Corp., can be cast within 0.003 in. This high-strength ceramic resists thermal shock. Yet, with little effort, it can be worked into almost any shape. Current use includes brazing platens for stainless-steel honeycombs which serve in space vehicles, missiles and supersonic aircraft.

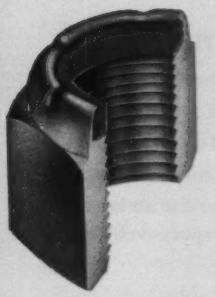
New Alloy for Mufflers

Use of a zinc-copper-titanium alloy for automotive muffler parts is under consideration. The material has thus far been confined to electrical systems and trim. Material cost is low.



When frequent adjustment or dis-assembly is anticipated

USE NYLON INSERT ELASTIC STOP® NUTS



Extended re-useability is built into every standard Elastic Stop nut. The tough nylon locking collar does the trick.

It grips entering bolt threads with a plastic-smooth perfect fit that dampens impact loads, absolutely resists vibration, yet never galls or damages bolt threads. The nut may be "stopped" at any place on the bolt, whether seated or not, for precision adjustment. When the nut is wrenched off for routine maintenance, the nylon collar, due to its elastic recovery, tends to resume its original shape. Thus upon re-installation it grips the bolt threads as effectively as on the original installation. And this on-off cycle can be repeated over 50 times on any bolt of standard quality without loss of holding power.

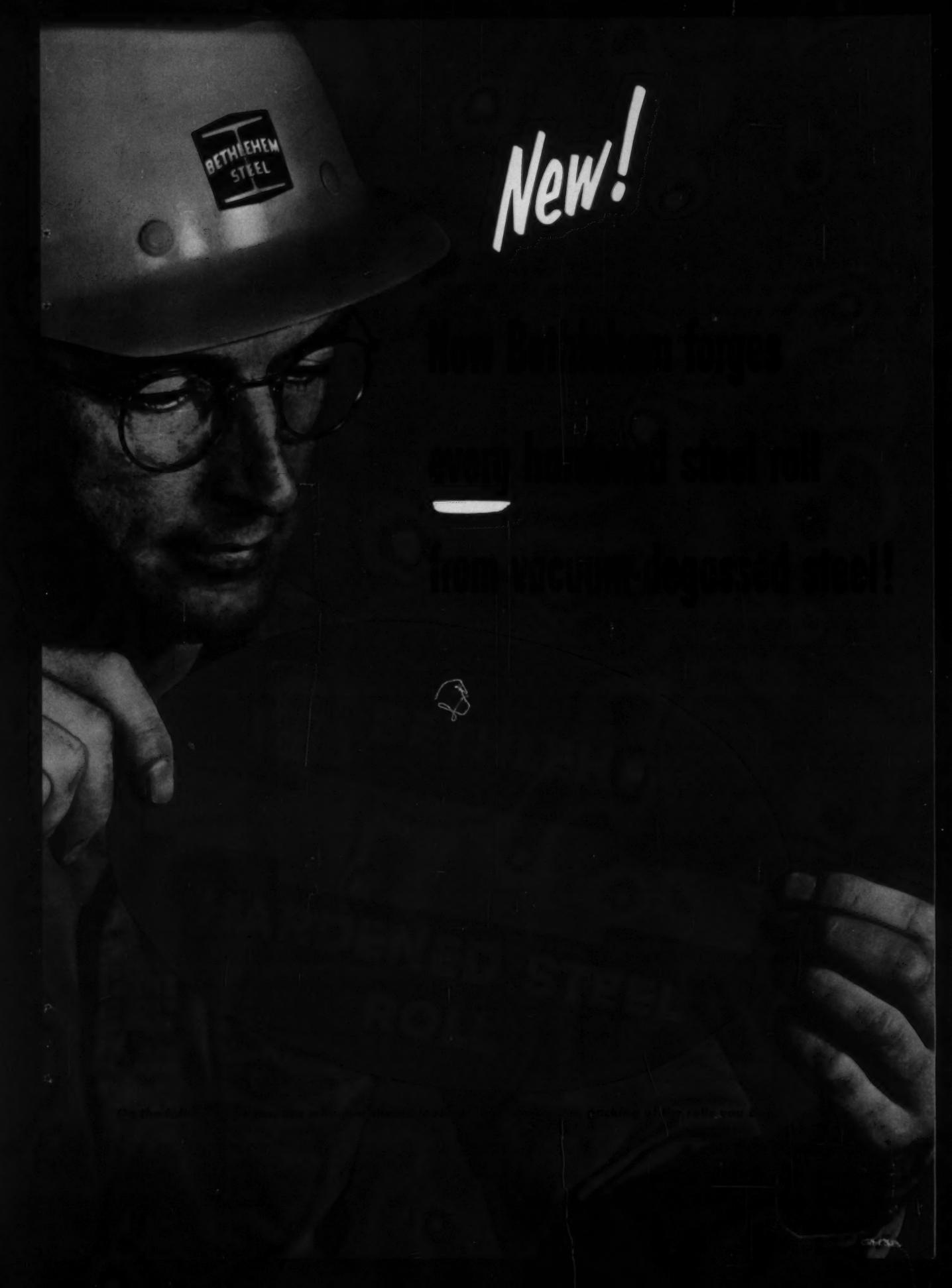
The nylon locking collar can also be used to seal off liquid seepage along the bolt threads and to prevent moisture from entering the load carrying areas. It is inert to oils, gasolines, salt atmospheres and common acids.

Consider the economy to you and your customers of this kind of fastener performance. Let us prove it to you. Ask for free test samples . . . or a copy of Recommended Test Procedures for Determining Locknut Re-Useability. Write: Elastic Stop Nut Corporation of America, Dept. S50-977, 2330 Vauxhall Road, Union, N. J.

ESNA

for the ring reliability

ELASTIC STOP NUT CORPORATION OF AMERICA


BETHLEHEM
STEEL
New!

Bethlehem vacuum-degassed steel minimizes the hazard of roll breakage

Pint size, king size, every in-between size. Now Bethlehem forges *every* hardened steel roll from vacuum-degassed steel.

Pioneer in "vacuum casting"

Bethlehem pioneered the development and use of vacuum-degassed ingots for highly stressed applications in the electric power, atomic energy, and other industries.

Our advanced steel-pouring techniques now permit us to pour molten steel from a furnace ladle to a secondary ladle within a vacuum chamber, and thereby remove harmful gases (we can also pour directly into a mold in the vacuum chamber). The secondary ladle is then taken out of the chamber and ingots of suitable size for hardened steel rolls can be cast under a blanket of inert gas.

Less gas means sounder steel

Because the vacuum-casting method reduces the volume of hydrogen and other gases, the steel is sounder, tougher, and cleaner than air-cast steel. It is this greater internal soundness which reduces the hazard of roll breakage.

Over 350 rolls now in service

In the past several years, we've produced and shipped over 350 large, vacuum-degassed hardened steel rolls. The outstanding performance of these rolls confirms our own production experience, which clearly proves the superior soundness of vacuum-cast rolls as compared to air-cast rolls.

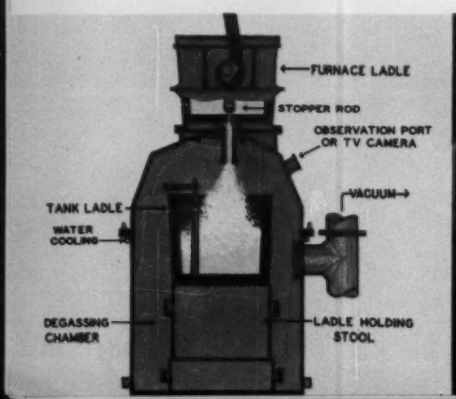
Fast delivery . . . no extra cost

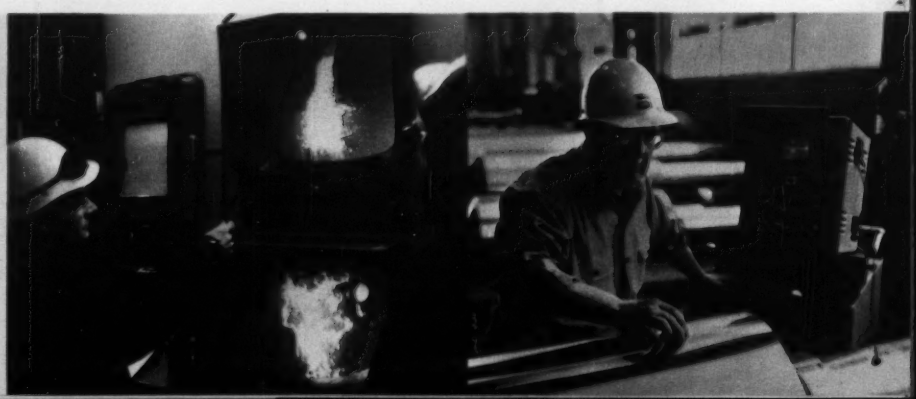
You have everything to gain (less roll breakage), nothing to lose (no price extra) by making your next purchase of hardened steel rolls Bethlehem vacuum-degassed rolls. Deliveries are excellent. Our sales offices are ready to give you the *whole* interesting story of this new Bethlehem development. Call or write the office nearest you today. Or write to us at Bethlehem, Pa.

STEEL IS TAPPED from the furnace into the furnace ladle. The furnace ladle is then attached to the vacuum tank, and the molten metal pours through a vacuum-tight seal into either a secondary ladle or a mold inside the degassing chamber. If poured into a ladle, ingots can be subsequently cast from this ladle under a blanket of inert gas.

TV TELLS HIM WHAT'S GOING ON. One TV camera peers inside the high-vacuum chamber into which the hot steel is gushing and shows the stream coming from the furnace ladle (top screen). Another camera, whose picture appears on the bottom screen, shows the action of the hot steel as it flows into either the secondary ladle or the mold set up inside the vacuum tank.

ULTRASONIC SOUND WAVES, pitched so high you can't hear them, penetrate every inch of the Bethlehem vacuum-degassed roll you see here. The waves relentlessly search out any possible inner discontinuities which, if present, would be indicated on the screen. When the Bethlehem inspector gives his OK, you can rely on the soundness of that roll.





BETHLEHEM VACUUM-DEGASSED ROLLS are made for every application—cold-rolling steel sheet, strip, tinplate, and non-ferrous metals. Every roll meets your specifications *exactly* on size, shape, hardness, and finish.

BETHLEHEM STEEL

BETHLEHEM STEEL

CHECKING EVERY DETAIL is more than a routine habit in the making of Bethlehem vacuum-degassed forged rolls. It's done with an extra measure of thoroughness, extra care—from the analysis of the steel to the critical inspection of the finished product.

These are the new symbols of quality for hardened-and-ground forged steel rolls

LOOK FOR THIS LABEL on the packing of the hardened steel rolls you buy. It's your guarantee that your rolls are forged from Bethlehem vacuum-degassed steel . . . steel that minimizes the hazard of roll breakage in your plant.

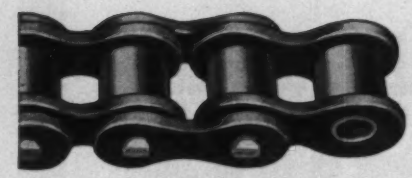
LOOK FOR THIS "V" STAMP on the ends of the rolls you buy. . . . "V" is for vacuum. You'll find this permanent identification on every Bethlehem roll from now on . . . because from now on Bethlehem forges hardened steel rolls *only* from vacuum-degassed steel.

For strength
. . . economy
. . . versatility

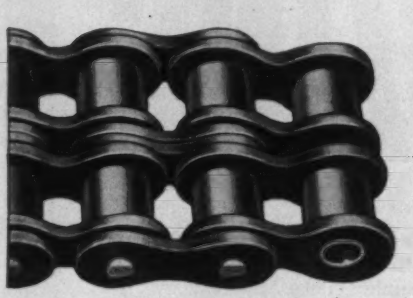
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

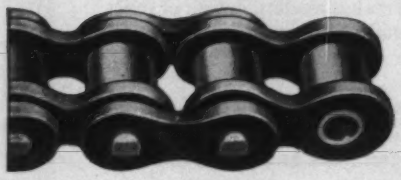
BETHLEHEM STEEL



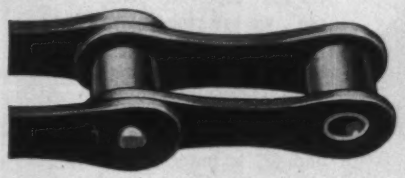
SINGLE STRAND



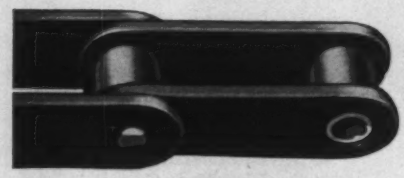
DOUBLE STRAND



SINGLE STRAND, HEAVY SERIES

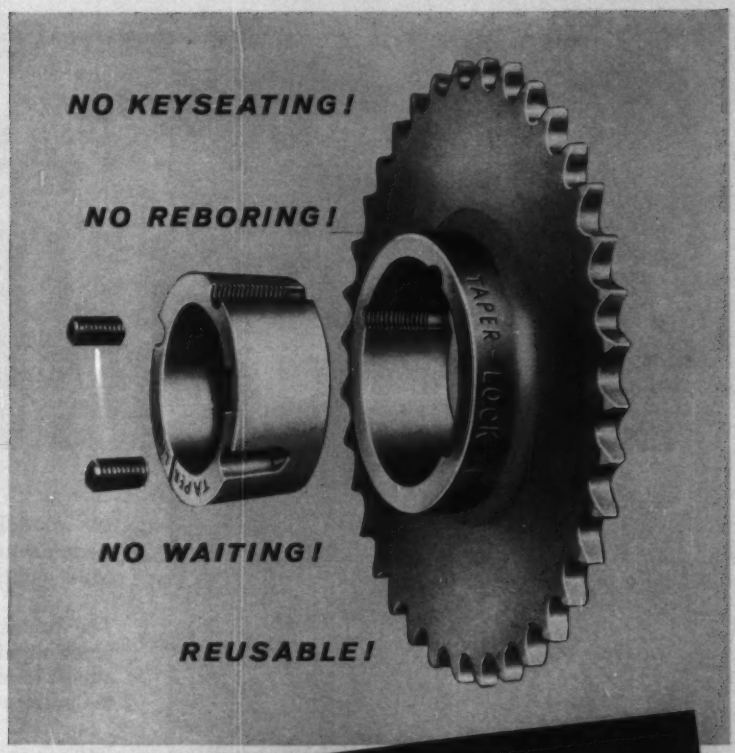


DOUBLE PITCH TRANSMISSION



DOUBLE PITCH CONVEYOR

DOUBLE PITCH CONVEYOR, LARGE ROLLERS



TAPER-LOCK SPROCKETS DODGE ROLLER CHAIN

DODGE Quality Roller Chain, teamed with Dodge Taper-Lock Sprockets, results in chain drives and chain conveyors that have the precision, efficiency and stamina necessary for the real economy of *long life*.

Moreover, Taper-Lock's reusable bushing makes a difference in overall cost. The ease of Taper-Lock mounting, the elimination of reboring, keyseating, and wasted time, add to the saving. Precision machining and true articulation lengthen the life of *both* sprocket and chain.

The Dodge line of chain, including standard attachments, is extensive. It meets a high percentage of all chain requirements.

In the Double Pitch series (both Transmission and Conveyor) the sizes which require special spacing for perfect tooth action are offered from stock in special double pitch design — to double the life of the chain and the sprocket!

Ask your local Dodge Distributor. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 800 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

DODGE
of Mishawaka, Ind.

Pipe mills, too, need
MODERNIZING
We are doing a lot of work these days on modernizing Continuous Butt Weld Pipe Mills and Seamless Tube Mills.
The continued and projected demand for pipe and tubes makes modernization of mills a must to maintain a competitive position in the business.
Individual items of the mills can be revamped. Existing mills can be rebuilt. Mills can be moved from one location to another.
As the "pipe mill people", we are constantly developing new ideas for new mills and existing mills. These ideas center on two main points: (1) to increase production and (2) to improve the quality of the pipe or tube.
We would like to talk to you about these new ideas and show you how your mills can be made more profitable. Write to Aetna-Standard Division, Blaw-Knox Company, Pittsburgh 30, Pennsylvania.
New Ideas in Pipe Mill Equipment Since 1901
Aetna-Standard Division
BLAW-KNOX

LETTERS FROM READERS

Likes Analysis

Sir—I would appreciate it if you could send me one copy of your series on planned profits. I have enjoyed The IRON AGE for more than a year now. Your evaluation and analysis of the steel and scrap markets have, in particular, been very helpful.—G. E. Grotos, Dept. of the Navy, Washington, D. C.

▪ **Reprint is on the way.—Ed.**

Impressed

Sir—I was very much impressed with the article "Ratio Analysis" in the July 21, 1960 issue of The IRON AGE. Will you please send me four copies of this article and others that appear on the same subject.—K. O. Schneider, Appleton Electric Co., Chicago, Ill.

▪ **The four copies will be sent.—Ed.**

Wants Reprints

Sir—The article, "Is Leasing the Best Solution to Machine Tool Financing," contained in the July 14, 1960 issue of The IRON AGE was quite interesting and we would appreciate receiving four reprints of it. — J. R. Taylor, Cockshutt Farm Equipment Limited, Brantford, Canada.

▪ **Reprints are enroute.—Ed.**

Very Useful

Sir—Will you be kind enough to send me one each of the reprints of the four part series of articles on planned profits. I would also appreciate receiving a copy of the recent article which discussed controls for management, as well as the article which discusses the system that controls production profits. If you can then add me to the list to receive copies of the next two articles following their publication I would greatly appreciate it. I continue to find your publication both interesting and informative and can honestly say that over the years it has proved very useful to me.—A. van der Lyn, Fuller Co., Catasauqua, Pa.

▪ **All will be done as requested.—Ed.**

Interested

Sir—I'm very interested in your article which appeared in The IRON AGE several months ago entitled, "Centralized Engineering Staff Puts Talent on Diverse Jobs." I would very much appreciate several reprints if they are still available. — R. Boggild, General Electric Co., Cincinnati, O.

▪ **They are available and on the way.—Ed.**

Missing Two

Sir—I have just read your interesting article "What's Management's Obligation to Its Problem Employees?" by Robert N. McMurry. This is part three of a series, therefore if you could send me the first two copies I would appreciate it.—H. E. Alvey, Union Carbide Nuclear Co., Oak Ridge, Tenn.

▪ **They're on the way.—Ed.**

"Ed, the boys and I have been talking. . . ."

The quickest most practical way to put strong threads in soft materials

the TAP-LOK® INSERT

SLOTTED

IN SOFTER METALS AND PLASTICS... Has full V-form external threads to provide maximum locking torque and permit wide choice of mating hole sizes. Recommended for soft aluminum, zinc die castings, sand castings and plastics. Meets requirements of MIL-MS-35914.

H-SERIES

FOR HIGHER STRENGTH MATERIALS... Has heavy wall and truncated root external thread and three-hole cutting edges for hard-to-tap higher-strength materials and to meet MIL and other specs calling for Class 3B thread fit for gaging after installation.

P-SERIES

FOR SPARK PLUG SOCKETS ... Designed to eliminate thread wear and renew damaged threads in spark plug sockets in aluminum cylinder heads. Available from stock for standard plug sizes to meet most common needs.

W-SERIES

FOR WOOD... Has coarse pitch external threads offering maximum strength in combination with ability to be driven into thin sections without splitting them. For furniture, cabinets and other wooden parts where strong, permanent threads are needed, or that are frequently assembled and disassembled.

Another fastener development from—

TAP-LOK GROOV-PIN CORPORATION

1143 Hendricks Causeway, Ridgefield, N. J.

Apron Conveyors—excellent for horizontal or inclined conveying.

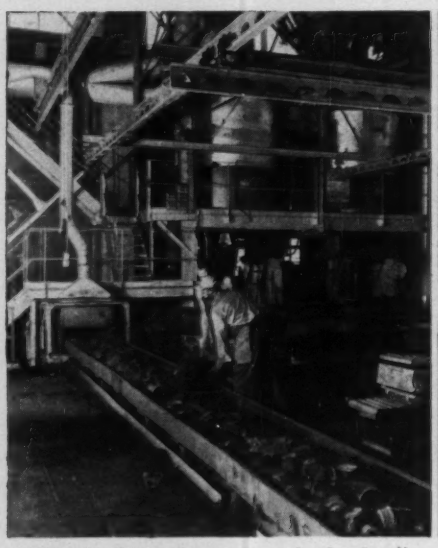
JEFFREY CONVEYORS TO MEET YOUR MATERIALS HANDLING NEEDS

COMPONENTS, ACCESSORIES FROM STOCK

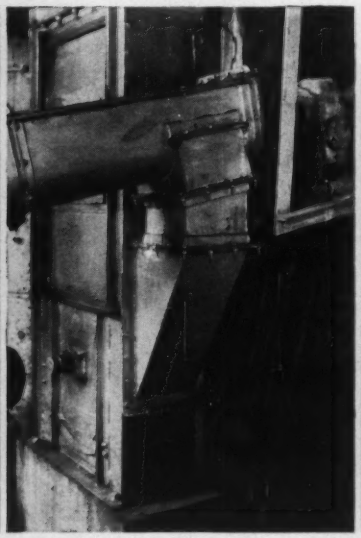
The plant engineer must treat every conveying job as a brand new project; the material to be moved has its own peculiar characteristics; distances, elevations and surroundings vary to affect operating conditions. Selecting a conveyor requires a thorough knowledge of the factors involved.

That's where Jeffrey's 75 years of materials-handling experience steps in to help. Based on this know-how, our engineers recommend the type of conveyor that will move the material most efficiently. They help plan it for maximum performance at most economical first cost; will even supervise installations.

Jeffrey conveying equipment maintains high production, lightens labor's burden and reduces operating costs. Send for data. The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.



Vibrating Conveyors—transport hard-to-handle materials easily.



Spiral Conveyors and Bucket Elevators—team up for horizontal and vertical travel.

Belt Conveyors—move materials swiftly across country or on short hauls.

Bin Valves • Car Pullers • Chains • Idlers • Pulleys • Sprockets • Take-ups • Buckets • Pillow Blocks

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...
TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

FATIGUE CRACKS

Your Candidate

This is an appropriate time to take notice of a check list we received from a manufacturers' association. We can't be sure it's original, but we can guarantee it's timely.

It's designed to help you decide when it comes to candidates who seek your important vote. The big questions:

Does he believe local government is best able to provide for the governmental need of its people?

Does he believe the **Federal government has become too big?** That some of the powers and responsibilities taken over by Washington should be returned to state and local governments?

Does he believe people are **entitled to work at any job** for which they are suited and that they shouldn't be required to join a labor organization to get or keep a job?

Does he believe **labor organizations should have to follow rules** which govern other individuals and other groups and that they shouldn't be allowed to acquire or exercise monopolistic powers over any segment of the economy?

Is he in favor of **membership control of labor organizations** and is he opposed to dictatorial power being exercised by professional union officers?

Regarding political contributions, does he feel a person should be **able to contribute to the party of his choice** and that **his money should not be used in political campaigns without his consent?**

Does he believe that **privately owned and operated business and industry will provide more and better jobs** and do more to increase the standard of living than government owned and operated industry?

Does he feel that **tax rates on individuals and business are too high** and should be reduced to moderate levels so capital needed by industry for growth can be accumulated and invested?

Does he believe **taxes should be levied** in such a manner to **make all people aware of the cost of government?**

Does he believe that the **state legislature shouldn't try to regulate** wage, hours, and working conditions of employees of local government units?

Does he believe that government at all levels should take positive steps to provide a climate which will **encourage business growth** and should avoid unnecessary regulation and harassment of business.

If your candidate can answer "Yes" to all of these questions, he should get your vote, says the manufacturers association. If he answers less than seven with a 'Yes' "his background, record and sources of support require careful checking," the association adds.

Reverse English

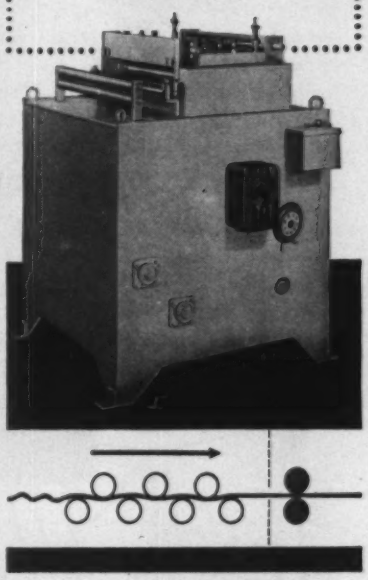
This Atomic Age can get very confusing.

Normally a scaffold is something which goes up in the air. But in building a new South Dakota missile base, scaffolding will start at ground level and go down.

It will form the platforms for workers constructing deep underground silos which will house and protect Titan missiles.

Waco-Porter Co., Minneapolis, provided the quarter million pounds of steel scaffolding to do the job.

new
benchmaster
Combination Feeding and Straightening Machine



Feeds measured lengths of coiled, strip or flat stock to presses, shears and other machines. Simultaneously removes kinks, moderate curl, camber, etc., with 9 adjustable power-driven rolls. Equipped with electro-magnetic clutch drive and adjustable timer for delivering measured feed lengths.

TWO MODELS: Single clutch for nominal feed accuracy or double clutch for increased feed accuracy. Standard feed range 0-60". Alternate ranges on request. Special timer bypass extends range to any length required. Models available for material to 50" wide, various gauges. Larger sizes are available on special order.

WRITE FOR NEW DESCRIPTIVE CIRCULAR!

benchmaster
World's largest manufacturer of small punch presses and mills.

1835 West Rosecrans Avenue, Gardena, Calif.

Every one a winner! ***Vancoram Exothermic Alloys***—Where quality's concerned, all five Vancoram Exothermic Alloys are outstanding! So choosing between them comes down to picking the right type for your application. Every Vancoram Exothermic Alloy has been completely and intensively tested in laboratory, pilot plant and in the field. You can be sure of utmost addition efficiency with minimum cooling effect on the metal. Next time you specify, remember these names: THERMOKROM® (Ferrochromium) · THERMOSIL® (Ferrosilicon) · THERMOKROMSIL® (Ferrochrome-silicon) · THERMOVAN® (Ferrovanadium) · THERMOCOL® (Ferrocolumbium). Each comes in steel cans—palletized for easy handling. Alloy content is exactly preweighed for accurate, no-trouble addition. For more facts and figures about the economies of these Vancoram Exothermic Alloys, call or write your nearest VCA District Office. Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y. · Chicago · Cleveland · Detroit · Pittsburgh

VANADIUM
CORPORATION OF AMERICA
Producers of alloys, metals and chemicals

VANCORAM

COMING EXHIBITS

Machine Tool Exposition — Sept. 6-16, International Amphitheatre, Chicago. (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Production Engineering Show — Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Coliseum Machinery Show — Sept. 7-15, Chicago. (Contact: A. B. Perkins, 2216 South Hill St. Los Angeles 7, Calif.)

Iron & Steel Show — Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress —Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

SEPTEMBER

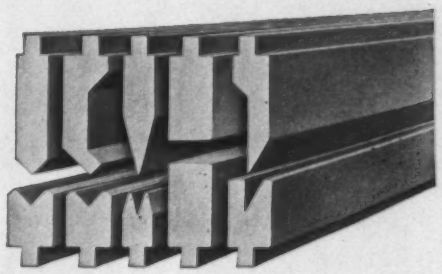
American Machine Tool Distributors Assn.—Annual meeting, Sept. 3-4, LaSalle Hotel, Chicago. Association headquarters, 1500 Massachusetts Ave., N. W., Washington 5, D. C.

Assn. of Lift Truck & Portable Elevator Mfrs.—Fall meeting, Sept. 12, The Cavalier Club, Virginia Beach, Va. Association headquarters, One Gateway Center, Pittsburgh 22, Pa.

Electronic Industries Assn. — Fall conference, Sept. 13-16, French Lick-Sheraton, French Lick, Ind. Association headquarters, 1721 DeSales St., N. W. Washington, D. C.

American Die Casting Institute — Annual meeting, Sept. 14-16, Edgewater Beach Hotel, Chicago. In-

press brake tooling



***Standard Type* PRESS BRAKE DIES**

62 different sizes and styles • Most in stock for off-the-shelf delivery

CHICAGO standard type press brake dies are used for a large variety of bending operations in any make or size of standard press brake. They are economical, and the quick delivery saves time in tooling up. Available in any length from 4 to 12 feet in increments of 2 feet; *induction hardened* or Diekrome steel.

The local distributors listed below offer immediate delivery on many sizes and styles of standard type CHICAGO press brake dies. If you have Bulletin STD-959 you can order any standard type die by number. Why not ask your nearest distributor for a copy? Also, if your requirements call for special multibend and forming dies, he can tell you about Dreis & Krump complete tooling service for any make of press brake.

Call your nearest distributor

ALABAMA
Birmingham
Hinkle Supply Co., Inc.
FAirfax 2-4541

CALIFORNIA
Los Angeles
Meyer Sheet Metal Mchry. Co.
MAdison 2-1477
San Francisco
Tay-Holbrook, Inc.
MArket 1-6800

GEORGIA
Atlanta
Allison Mchry. Co.
JAckson 4-1741

INDIANA
Indianapolis
E. L. Humston Co., Inc.
WAlnut 5-9691

IOWA
Bonaparte
Corry's Machine & Tool—Phone: 112

KANSAS
Wichita
Ellfeldt Mchry. & Supply Co.
AMherst 7-9773

MASSACHUSETTS
Cambridge
Austin-Hastings Co., Inc.
KIrkland 7-4480

MICHIGAN
Detroit
J. Lee Hackett Co.—TRinity 2-6442

MINNESOTA
Duluth
Girard Steel Supply Co.
MArket 8-1001
Minneapolis
Minnesota Steel & Mchry. Co.
FEderal 3-6273
St. Paul
Girard Steel Supply Co.
MIdway 6-8635

MISSOURI
Kansas City
Ellfeldt Mchry. & Supply. Co.
VIctor 2-5494

NEW YORK
New York
Federal Machinery Corp.
CAnal 6-3022
H. Weiss & Co.
CAnal 6-4256

NORTH CAROLINA
Greensboro
Armentrout Mchry. Co.
Phone: 4-8218

OHIO
Cleveland
Wm. K. Stamets Co.
MAin 1-5124
Columbus
Vorys Brothers, Inc.
AXminster 4-4701

OKLAHOMA
Oklahoma City
Hart Industrial Supply Co.
REgent 9-2541
Tulsa
Hart Industrial Supply Co.
LUther 3-2175

OREGON
Portland
Hallidie Machinery Co., Inc.
ATlantic 2-2244

PENNSYLVANIA
Philadelphia
Delaware Valley Mchry., Inc.
OLdfield 9-4600
Milton Equipment Co.
WAlnut 2-1734
Pittsburgh
Wm. K. Stamets Co.
ATlantic 1-8091

TEXAS
Dallas
Briggs-Weaver Mchry. Co.
LAkeside 8-0311
Fort Worth
Briggs-Weaver Mchry. Co.
EDison 6-5621
Houston
Mehl Machinery, Inc.
FAirfax 3-1313

WASHINGTON
Seattle
Hallidie Machinery Co., Inc.
PArkway 3-9520

WISCONSIN
Milwaukee
Production Equipment, Inc.
GReenfield 6-6075

CANADA

A. R. Williams Mchry. Co., Ltd.

ALBERTA
Calgary—Phone: 5-4425
Edmonton—Phone: 24341

BRITISH COLUMBIA
Vancouver—TAtlow 9411
Victoria—Phone: 4-7623

MANITOBA
Winnipeg—SPruce 4-4458

NOVA SCOTIA
Halifax—Phone: 5-4389

ONTARIO
Hamilton—JAckson 9-5388
Ottawa—CEntral 6-3661
Toronto—RUssell 7-2494
Windsor—CLearwater 4-4762

QUEBEC
Montreal—RIverside 8-9381

9506

A Tradition of Quality and Value since 1899

Press Brakes • Press Brake Dies
Straight-Side-Type Presses
Hand and Power Bending Brakes
Special Metal-Forming Machines

CHICAGO DREIS & KRUMP

DREIS & KRUMP MANUFACTURING CO.
7430 S. Loomis Blvd., Chicago 36, Illinois

Engineering Briefs:

HOW A PRODUCTION BREAKAGE PROBLEM WAS SOLVED . . .AND RESULTED IN CUMULATIVE BENEFITS

The big headache, though, was eliminating the prime problem— product breakage

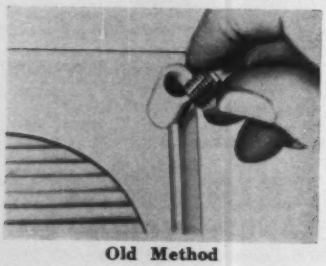
In the manufacture of such highly competitive products as table model radios, cost is a prime selling factor. Even the tiniest washer, which may have cost a micrometer fraction of one penny, is figured into the price tag.

By a lucky "break," and one which was not anticipated, the breakage of radio front panels during assembly operations provided a major radio manufacturer with some surprising answers—some of which were completely unexpected.

It all started on the assembly line for a newly designed table radio. In the insertion of a self-tapping, bronze bushing — an internal-external machined bushing— into a plastic boss of the panel, the plastic panel would crack or fracture. Consequently, when panels fractured under this self-tapping pressure, the production line practically stopped. This meant costly down-time all the way down the line. In addition, the destroyed panel was a complete reject. The only part salvaged was the bushing, providing the threads had not been damaged. But then, additional labor cost was involved in removing the bushings from damaged panels.

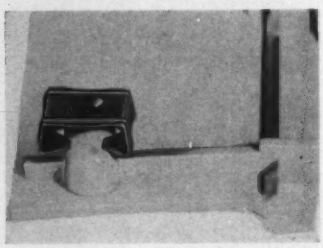
In order to keep production costs as low as possible which, therefore, would be reflected in the overall cost—or retail price—of the radio, a new fastener design had to be found. The search for an efficient fastener led to George K. Garrett Company, where a special type of spring fastener was custom designed.

The spring fastener, of clip design, was made of high carbon spring steel; it was formed with four points of engagement which securely anchored the spring fastener to the plastic boss. No special tools or technique of fastening it were required; actually, because of its four point design, it was self-centering.



Old Method

Being heat-treated to a hardness of maximum resiliency, the fastener eliminated the possibility of fracturing the panel due to its "give." The fastener was formed with the cone impression, thus performing the same function as a threaded hole in which the holding bolt was tightened to hold both front and rear panels together.



New Method

Since using the Garrett spring fastener for this particular assembly operation, production of radio panels ran smoothly without breakage due to the efficiency of the fastener. In fact, this phase of production moved even faster.

In the final analysis, a more efficient fastener had been found; also, it eliminated the costly machined bushing . . . therefore, fastener cost was greatly reduced; assembly operations were smoother, too.

There are many types of spring fasteners being designed, formed, heat-treated and finished in the Garrett plant . . . which is one of the most completely integrated plants in the industry.

All operations pertaining to fasteners are performed under the Garrett roof, including Garrettizing, a non-electrolytic plating process **without hydrogen embrittlement.** Complete details may be obtained by writing George K. Garrett Company, Inc., 8887 Torresdale Ave., Philadelphia 36, Pa.

MEETINGS

stitute headquarters, 366 Madison Ave., New York.

National Foundry Assn. — Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.— Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 33 West 39th St., New York.

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc. —Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York. Association headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Boiler Institute, Inc. — Fall meeting, Oct. 12-14, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1308 Land Title Bldg., Philadelphia.

WHO FORGES THE TOUGH ONES?
and dynamic balances them, too?

To further National Forge's reputation for producing precise forgings, we've installed one of the largest, most accurate dynamic balancing machines in use. Our American-Trebel has a 33,000-pound, 60-foot capacity.

Pictured on the machine is a 42 ft. propeller shaft that has been forged, machined, and hollow bored—all operations done in our National Forge plant NF specialists are shown balancing this gigantic 15,500 lb. shaft.

If you want one responsible source to produce and control the quality of your forgings. .from melting and forging the steel through machining and dynamic balancing... call National Forge. Let us quote on your next job—and *prove* "who forges and dynamic balances the tough ones . . . best!".

NF

NATIONAL FORGE COMPANY
IRVINE, WARREN COUNTY, PA.

NF-59-04

For information on the "tough' ones and the machinery that makes them best, write for Bulletin NF 1.

Allied Metals' fast service on Stainless Steel

Walter Miller, President of Allied Metals, Inc., Houston, Texas, believes that service is the key to successful steel warehousing. His customers for Stainless Steel are fabricators for the petroleum and petro-chemical industries along the Gulf where emergencies demand quick service, day or night. Allied Metals usually delivers Stainless Steel plates, cut to size, in 24 hours or less.

To be sure of delivering just what a customer needs when he wants it, Mr. Miller maintains a sprawling 25,000 square foot "lumber yard" of Stainless Steel and other metals. Over 350,000 pounds of plates are kept on hand at all times. In addition to Stainless Steel sheets, plates, piping and tubing in various alloys and sizes, Allied Metals stocks $75,000 worth of Stainless flanges and valves.

gives pumping station its sea legs

Quality service is emphasized at Allied Metals. Salesmen have engineering training and a metallurgist is available to consult with customers on special problems. Many times they are called in the middle of the night with a rush order. A customer who needs material fast gets it . . . in a matter of hours.

One of Allied Metals' customers, who depend on Stainless Steel and fast service, forms Stainless Steel into vessels, pipes and ducts for processing, storing and transporting petroleum products. Right now they are building a unique submersible pumping station for an off-shore drilling operation. Shallow water near the shore prevents loading deepwater ships at the dry-land storage tanks. A permanent installation would be a navigational hazard in the narrow channel.

To allow off-shore loading, sea legs, made of 20-inch Stainless Steel piping, support a platform in 110 feet of water—some distance from the shore. When not in use, legs are flooded and the pumping station sinks to the bottom out of the way of shipping.

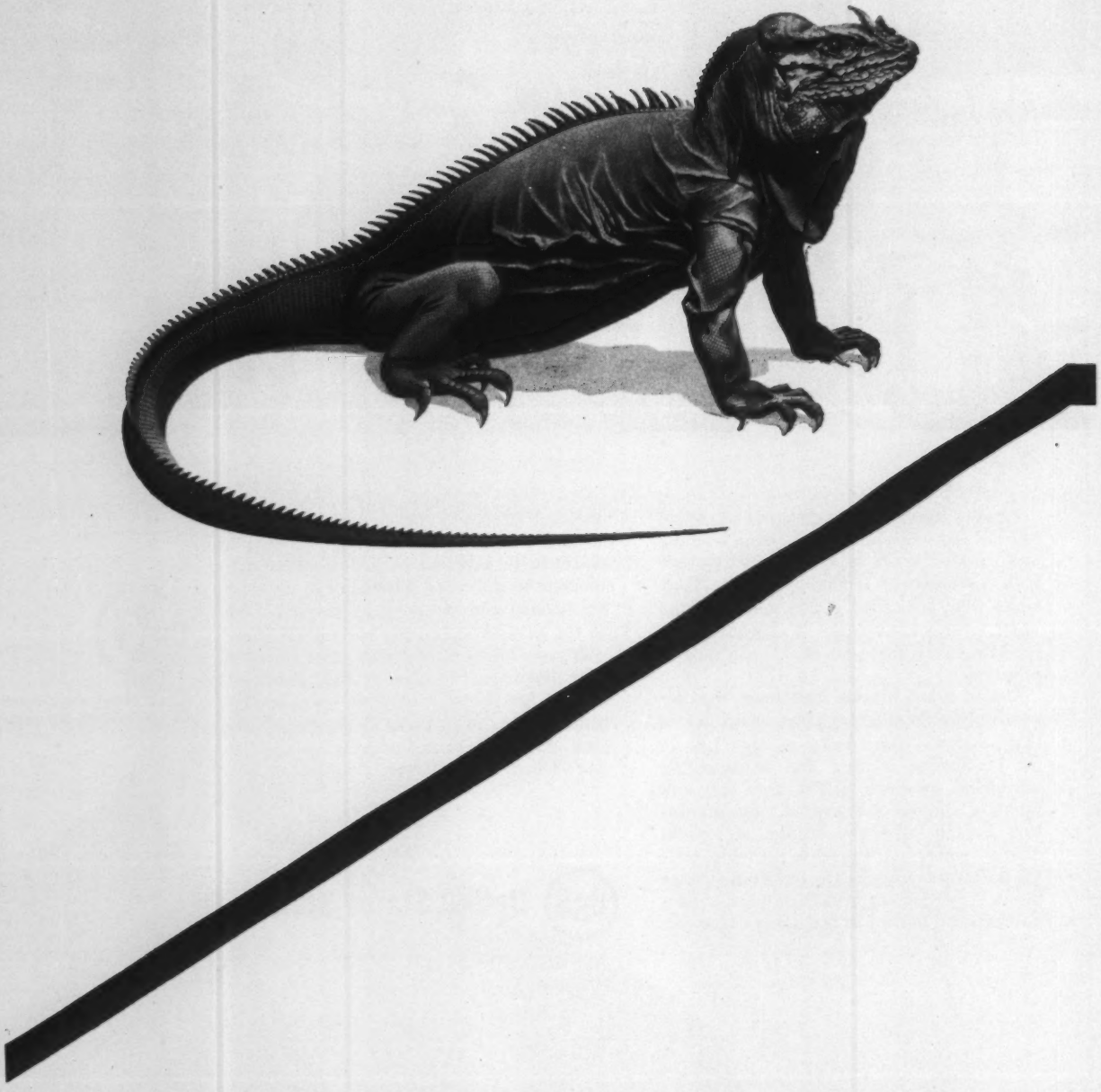
It pays to use the right material from the start. Stainless Steel has a reputation for costing less because it lasts so long. Its combination of strength, corrosion-resistance and high temperature properties is unmatched. *USS is a registered trademark*

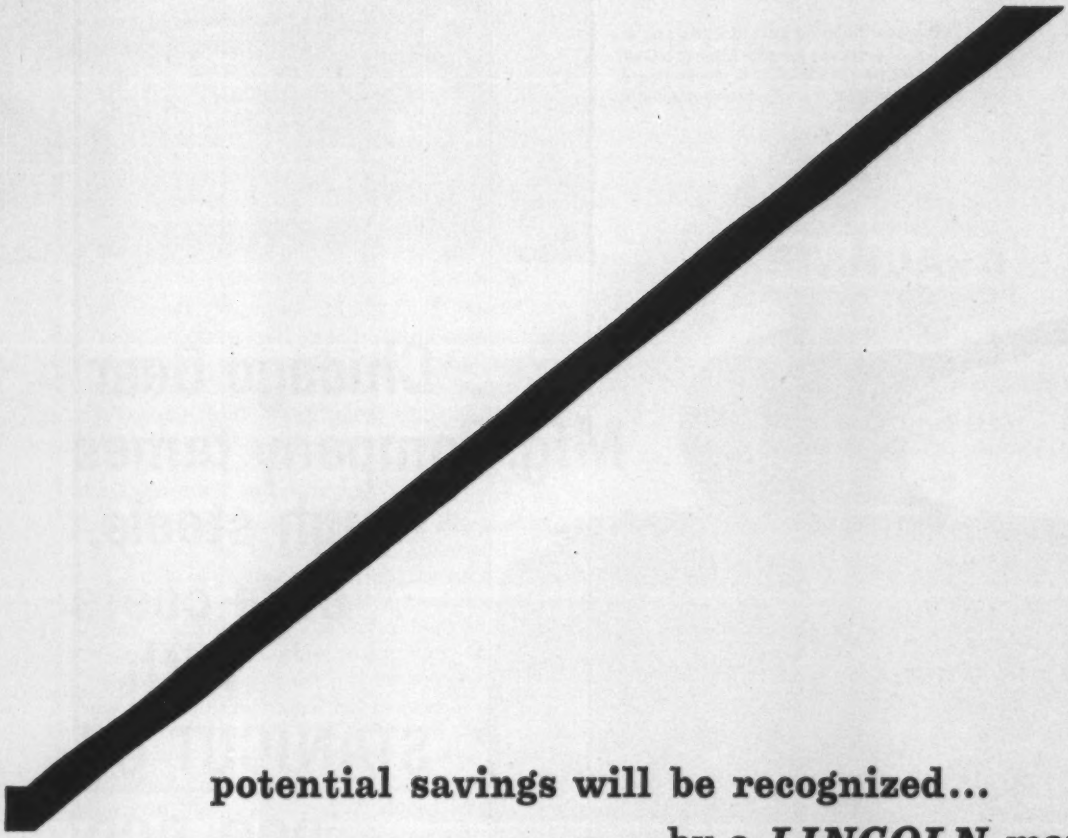
USS United States Steel

This mark tells you a product is made of modern, dependable Steel.

An Iguana will be recognized...
by a *HERPETOLOGIST*

(specialist in reptiles)





potential savings will be recognized...
by a *LINCOLN* man

(specialist in arc welding)

ANY IDEA which can cut welding time from 90 to 45 minutes on missile beams for the Army is darned important! That's exactly what happened in a New Jersey plant.

A LINCOLN Field Engineer was walking through the plant with the Welding Foreman and Plant Manager. Naturally he was interested in watching the welding operation on missile beams. A thought crossed his mind. He asked if he could demonstrate LINCOLN Jetweld electrodes on the beams. He rolled up his sleeves; took some Jetweld from the trunk of his car, and cut the welding time from 90 to 45 minutes. The weldors on the job did the same.

That afternoon the Field Engineer finished his plant tour and spotted some applications for Fleetweld 37 electrodes for welding sheet metal on trailer bodies. Again welding time was cut almost in half, cleaning time reduced and overall costs slashed to the bone.

Quite a day's work for one Field Engineer . . . but putting PROFIT into welding operations is part of each LINCOLN man's job. You can count on him to show you . . . not tell you how to cut costs and make more money.

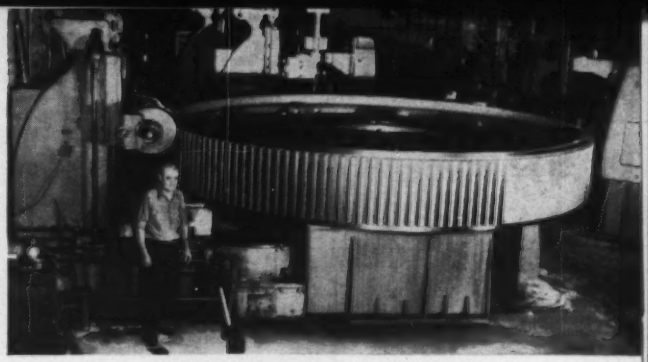
That's why we say it's a good idea to do business with LINCOLN where arc welding is a specialty and cost reduction comes to you as a "plus" at no charge.

Call your LINCOLN Field Engineer today.

THE LINCOLN ELECTRIC COMPANY

Dept. 1930 • Cleveland 17, Ohio

LINCOLN WELDERS



Big gear hobbing jobs like this one are everyday jobs for Chicago Gear. STANICUT Oil 208 BCS is the cutting oil used in all gear manufacturing machines.

Chicago Gear Mfg. Company tames tough steels, cuts costs with STANICUT Oil 208 BCS

Tames tough steels. Gears from one to 300 inches in diameter are machined by Chicago Gear. Steels up to 375 Brinell hardness are worked. STANICUT Oil 208 BCS helps them do it. STANICUT 208 contains maximum amounts of sulfur, chlorine and compounding to make it suitable for handling tough alloy steels. It is viscous enough to stay on big tools and work pieces, yet fluid enough to flow over the work in sufficient volume to assure good cooling.

Cuts costs. STANICUT Oil 208 BCS is used at Chicago Gear for all gear hobbing operations and for all other applications requiring a straight cutting fluid. There's no chance of the wrong fluid being used, thus no costly losses. One fluid cuts down inventory, saves time in keeping track of stocks, cuts paper work handling and ordering.

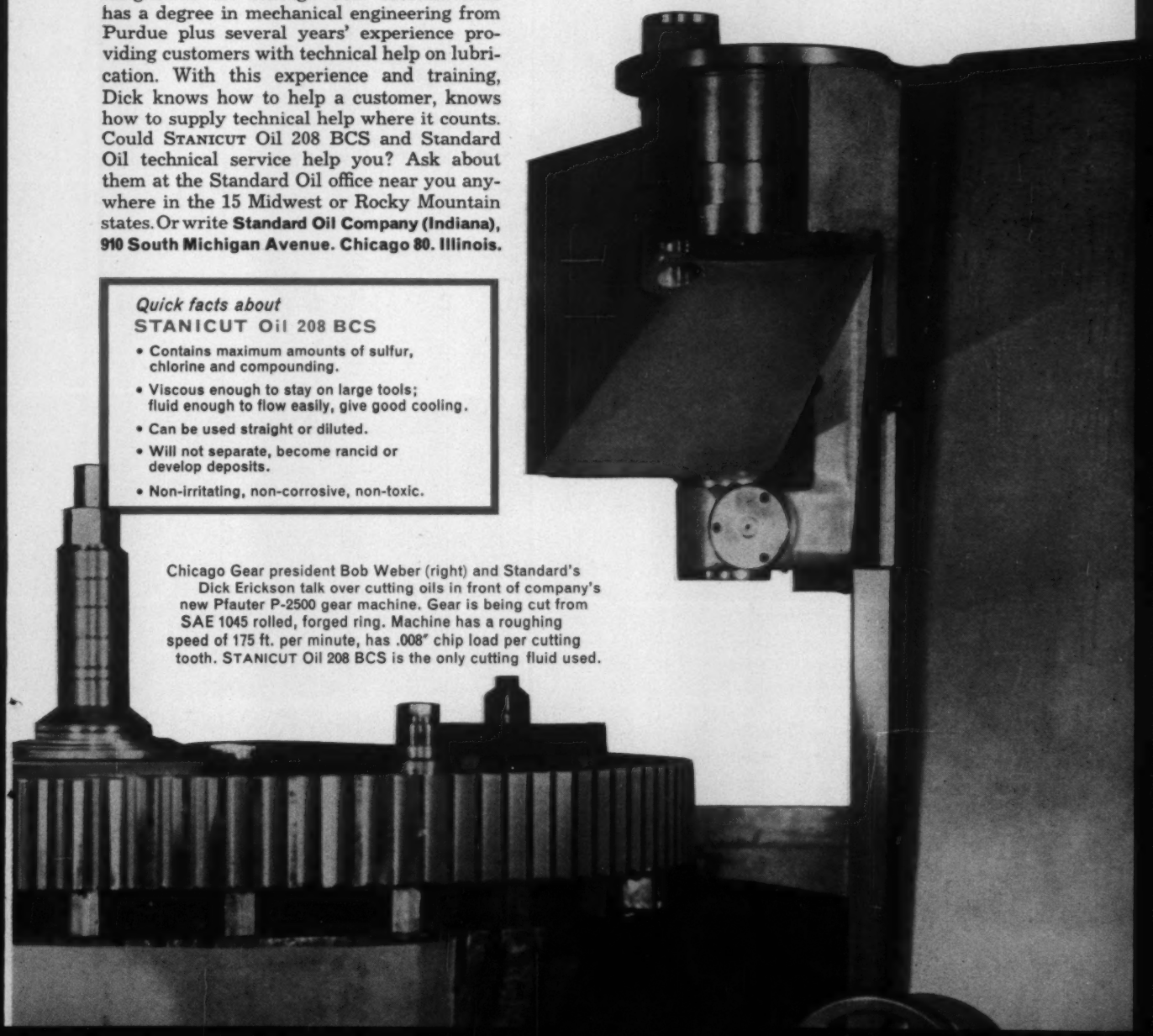
Gets service. Standard Oil's Dick Erickson is assigned to the Chicago Gear account. Dick has a degree in mechanical engineering from Purdue plus several years' experience providing customers with technical help on lubrication. With this experience and training, Dick knows how to help a customer, knows how to supply technical help where it counts. Could STANICUT Oil 208 BCS and Standard Oil technical service help you? Ask about them at the Standard Oil office near you anywhere in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue. Chicago 80. Illinois.**

Quick facts about
STANICUT Oil 208 BCS

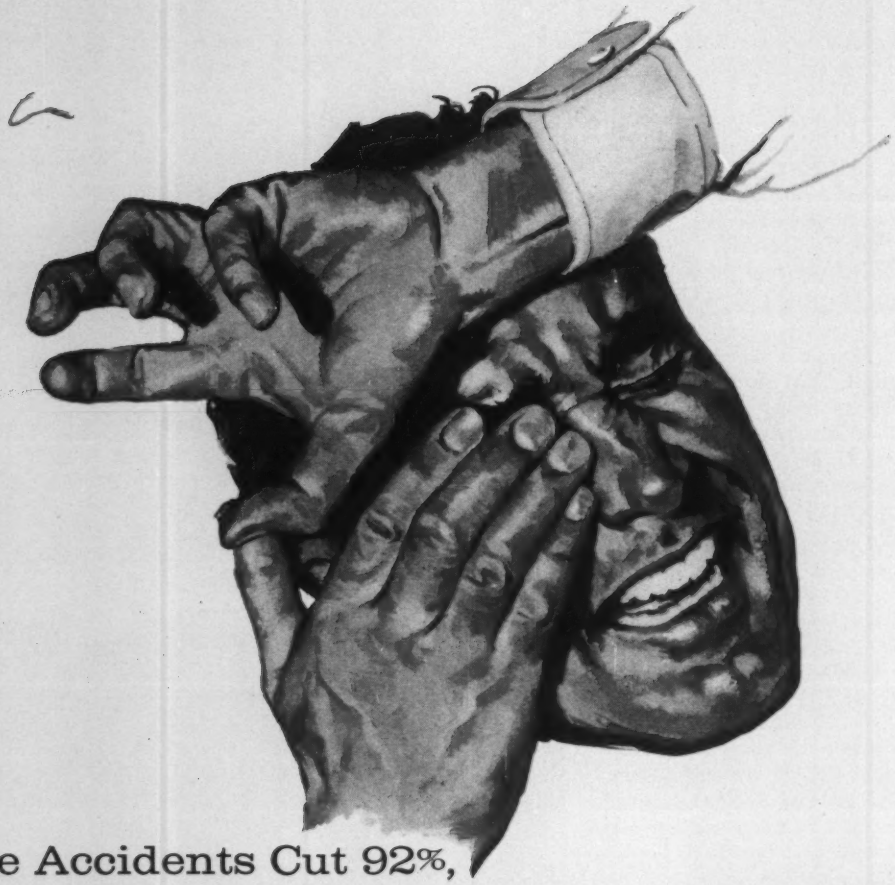
- Contains maximum amounts of sulfur, chlorine and compounding.
- Viscous enough to stay on large tools; fluid enough to flow easily, give good cooling.
- Can be used straight or diluted.
- Will not separate, become rancid or develop deposits.
- Non-irritating, non-corrosive, non-toxic.

STANDARD

You expect more from Standard and you get it!



Chicago Gear president Bob Weber (right) and Standard's Dick Erickson talk over cutting oils in front of company's new Pfauter P-2500 gear machine. Gear is being cut from SAE 1045 rolled, forged ring. Machine has a roughing speed of 175 ft. per minute, has .008" chip load per cutting tooth. STANICUT Oil 208 BCS is the only cutting fluid used.



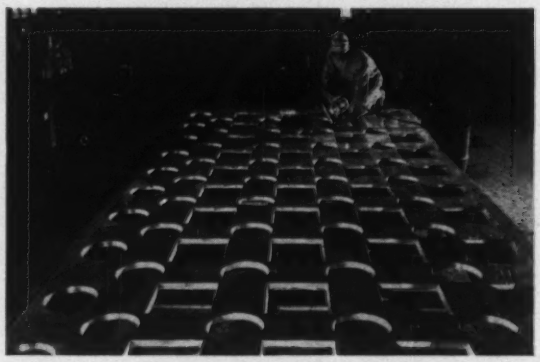
Eye Accidents Cut 92%, Compensation Ins. Costs Cut 51% at CPC Engineering with AO Protection Program

CPC ENGINEERING CORP., Sturbridge, Mass., fabricators of steel, aluminum, stainless steel components and pressure vessels, is another company that KNOWS eye protection pays off. Before installing an AO prevention program, eye injuries in this young, growth company were 120 per year and workmen's compensation insurance premiums $12,000. Currently eye injuries are ten per year and premiums are $5,800. The hours saved by the program are an additional advantage.

Another user of AO eye protection equipment, one of America's largest companies (a company that has prevented 51,000 eye accidents and saved $453,000 in 13 years) puts it this way: "The potential loss of an eye from the hazards of a work operation is the basic justification of an eye protection program. The additional potential dollar savings in medical and compensation costs and time per employee protected per year indicate that the program is self-supporting."*

*Records indicate an AO eye protection program can pay for itself in less than 6 months. Write for new booklet, "Eyes Are Expensive Targets".

Always insist on AO Trademarked Safety Products.



Worker sawing aluminum base plate for nuclear fuel storage rack.

American Optical COMPANY
SAFETY PRODUCTS DIVISION
Southbridge, Massachusetts

Safety Service Centers in Principal Cities

Your Surest Protection . . . AO SURE-GUARD Products

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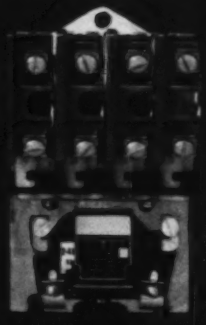
CLARK CONTROLS...

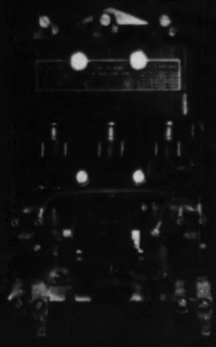
NEW Push Button Line

"PM" Relay Line...



with new "Color-Selective" Conversion Kits

Type "CY" Starters... the standard for longer operating life



SEE FOR YOURSELF WHY THEY GIVE YOU MORE THAN ANY CONTROLS YOU CAN NAME

The **CLARK CONTROLLER** *Company*

compare

see for yourself why...

NEW Clark Push Buttons with exclusive wipe action contacts give you more

WIPING CONTACTS—a Clark Controller exclusive—assures minimum contact resistance at all times. As contacts close, unique Clark design creates a sliding action that wipes faces clean of dust and oil.

DUAL COLOR-CODING—buttons and ferrules—in many separate colors, makes possible advantageous color-coding of stations both by individual operating function and group function.

THREE TYPES OF UNITS offer greater flexibility for any application:

- Type HO Oiltight—Panel or Base Mounted
- Type H NEMA I—Base Mounted
- Type H NEMA I—One Hole (Panel) Mounted

The new Clark Push Button line includes a complete range of buttons, selector switches, pilot lights and push-to-test lights or lighted push buttons—available as individual control units or mounted in enclosures or on flush plates.

compare

see for yourself why...

Clark Type "CY" Starters give you more than any other A-C magnetic starter

Whatever your basis for comparison let your own performance check show you how Clark Type "CY" Starters outperform all other starters—give you more.

DEPENDABILITY? Compare the Clark Type "CY" Starter in the toughest application you can find—then see for yourself how it continues to operate dependably where other starters fail.

LONGER OPERATING LIFE? Make your own comparison life test—then see for yourself how much better a Clark Type "CY" Starter holds up under any operating conditions.

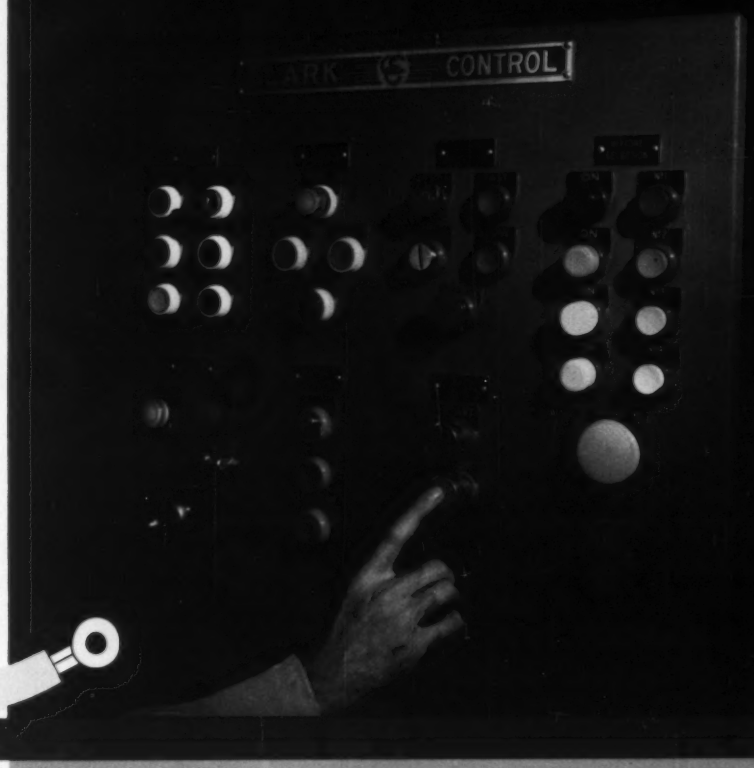
OTHER ADVANTAGES? Your own comparison tests on installation, maintenance, and any other requirements, will let you see for yourself that the Clark Type "CY" Starter gives you more than any other A-C magnetic starter in every area of importance.

Clark Type "CY" Starters are available in many combinations, in sizes 0 thru 4, and in a variety of enclosures and forms to meet every industrial application.

More for your money with

CLARK PUSH BUTTONS

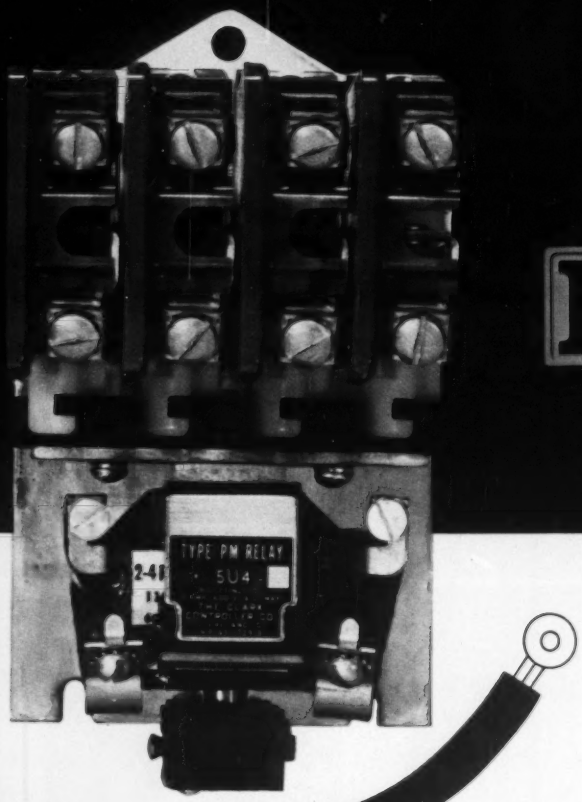
DEMONSTRATION? Ask your local Clark distributor or district sales representative for a demonstration and free literature on the new push button line. Or, write direct to The Clark Controller Company.



More for your money with

CLARK STARTERS

MORE INFORMATION? Your local Clark distributor or district sales representative will be glad to help you set up your own comparison tests. Ask for literature on the complete Clark Type "CY" Starter line, too. Or, write direct to The Clark Controller Company.



compare

see for yourself why...

Color-coded conversion kits help solve any relay circuit problem with building-block simplicity

New color-coding of conversion kits by function now makes it possible for relay users to take even greater advantage of the versatility and flexibility of the complete, integrated line of Clark "PM" Relays.

Basic relays are easily modified on the job with a few simple conversion kits to give you a virtually unlimited number of circuit arrangements on convertible pole, universal pole, latch and time-delay relays.

The "modular construction" of all relays in the Clark "PM" line insures integrated uniformity, compactness and flexibility. Functional alignment in mounting results in neater, more uniform panels and most efficient utilization of valuable space.

More for your money with

CLARK RELAYS

COMPLETE INFORMATION on Clark color-selective conversion kits is available through your local Clark distributor or district sales representative. Or, write direct to The Clark Controller Company.

The
CLARK CONTROLLER *Company*

"Everything Under Control"

Main Plant: *Cleveland 10* • **Western Plant:** *Los Angeles 58*
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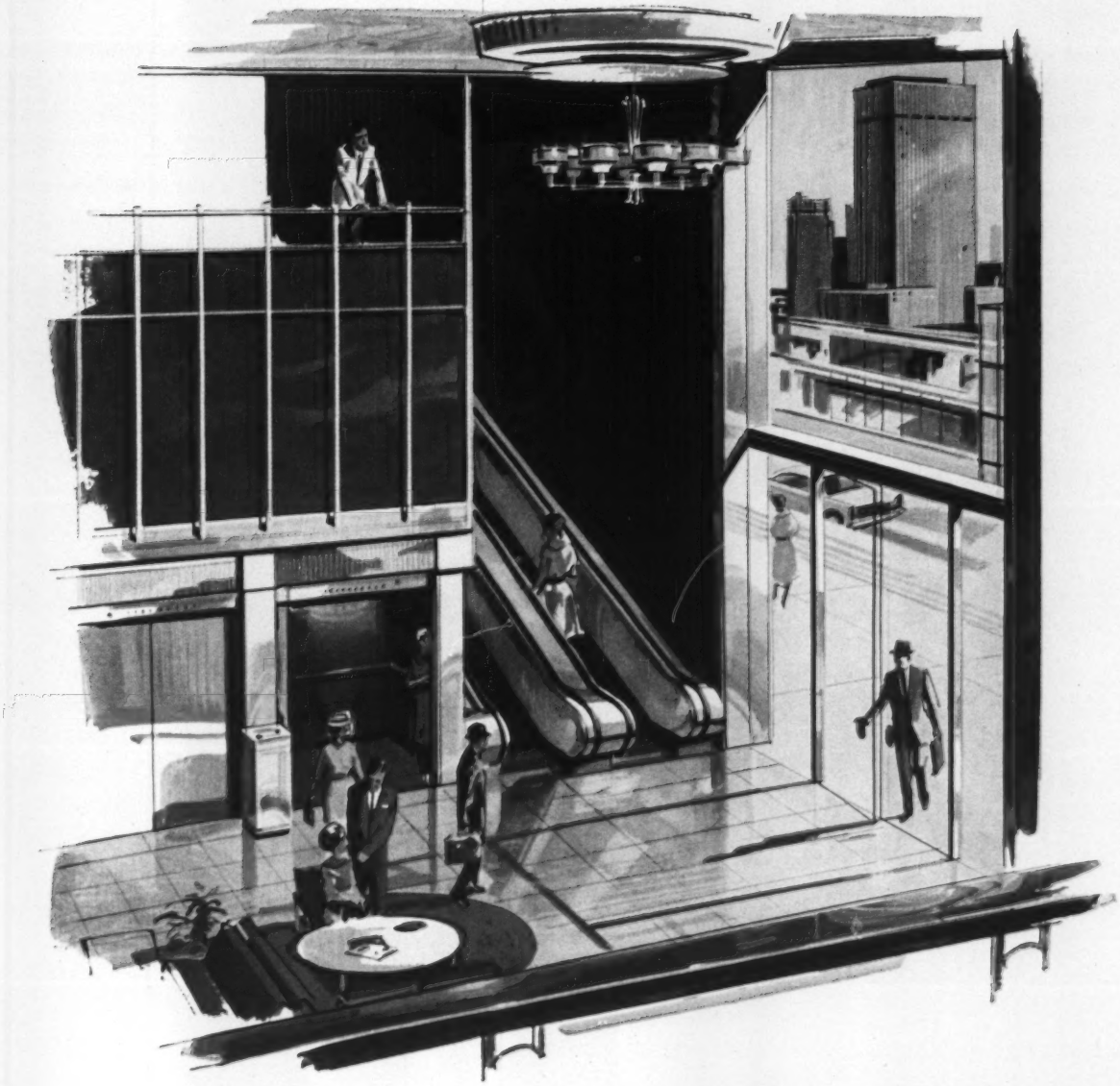


stainless steel

No other metal has the strength and beauty of Stainless Steel. In heavy use areas and for weather exposed panels and trim, its hard lustrous finish is easy to clean and economical to maintain for the life of a building. For the architect and the builder no other material performs so well today and promises so much for tomorrow.

There is nothing like stainless steel for ARCHITECTURE

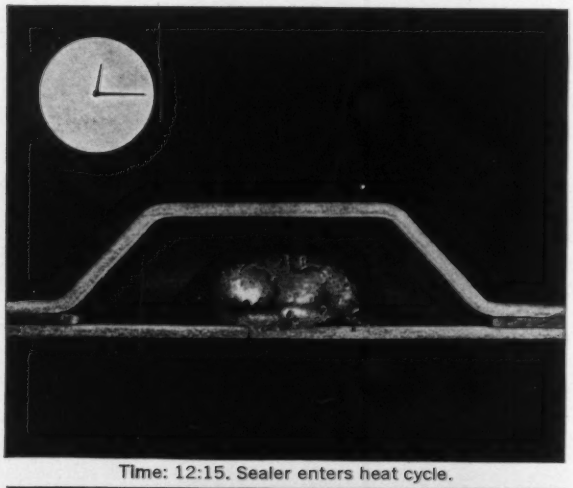
Look for the **STEELMARK** on the products you buy.

McLouth Steel Corporation,
Detroit 17, Michigan

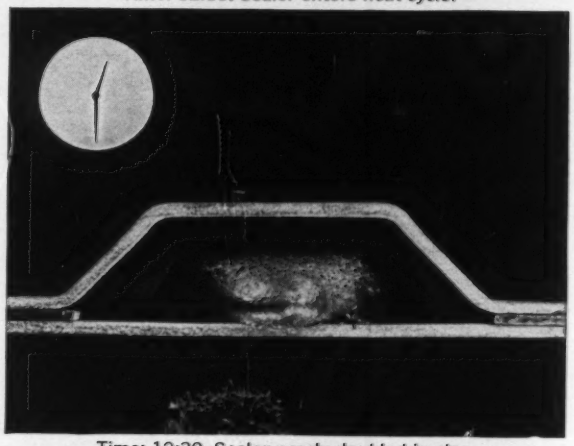
Manufacturers of high quality Stainless and Carbon Steels

McLOUTH STAINLESS STEEL

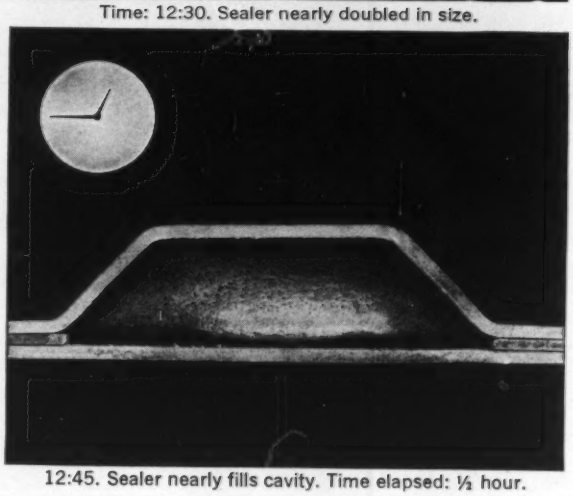
Positive way to seal irregular gaps and seams—3M Heat Expandable Sealers



Time: 12:15. Sealer enters heat cycle.



Time: 12:30. Sealer nearly doubled in size.



12:45. Sealer nearly fills cavity. Time elapsed: ½ hour.

You can simplify tough sealing jobs of irregular gaps and seams with 3M Heat Expandable Sealer EC-2117. When heated this liquid will expand 150% in volume and cure to a solid sponge rubber material to tightly fit the shape of the seam, affording a weather-tight, water-tight, dirt-tight seal.

EC-2117 is designed to expand and cure to a resilient sponge-like rubber which will adhere to most surfaces. It can also function as a weld-thru sealer which does not alter normal spot welding procedure, nor interfere with weld quality. EC-2117 adheres well to both clean and oily surfaces. Use it wherever irregular openings must be filled, or where seam width is not constant.

Let 3M Adhesives, Coatings and Sealers help speed your production, improve product quality. For free information, write on your company letterhead to: AC&S Division, 3M Company, Dept. SBQ-80, St. Paul 6, Minnesota.

ADHESIVES, COATINGS AND SEALERS DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

A complete heat treating line is more economical to purchase with General Electric system engineering aid and "one-source" manufacturing responsibility.

HEAT
from General Electric

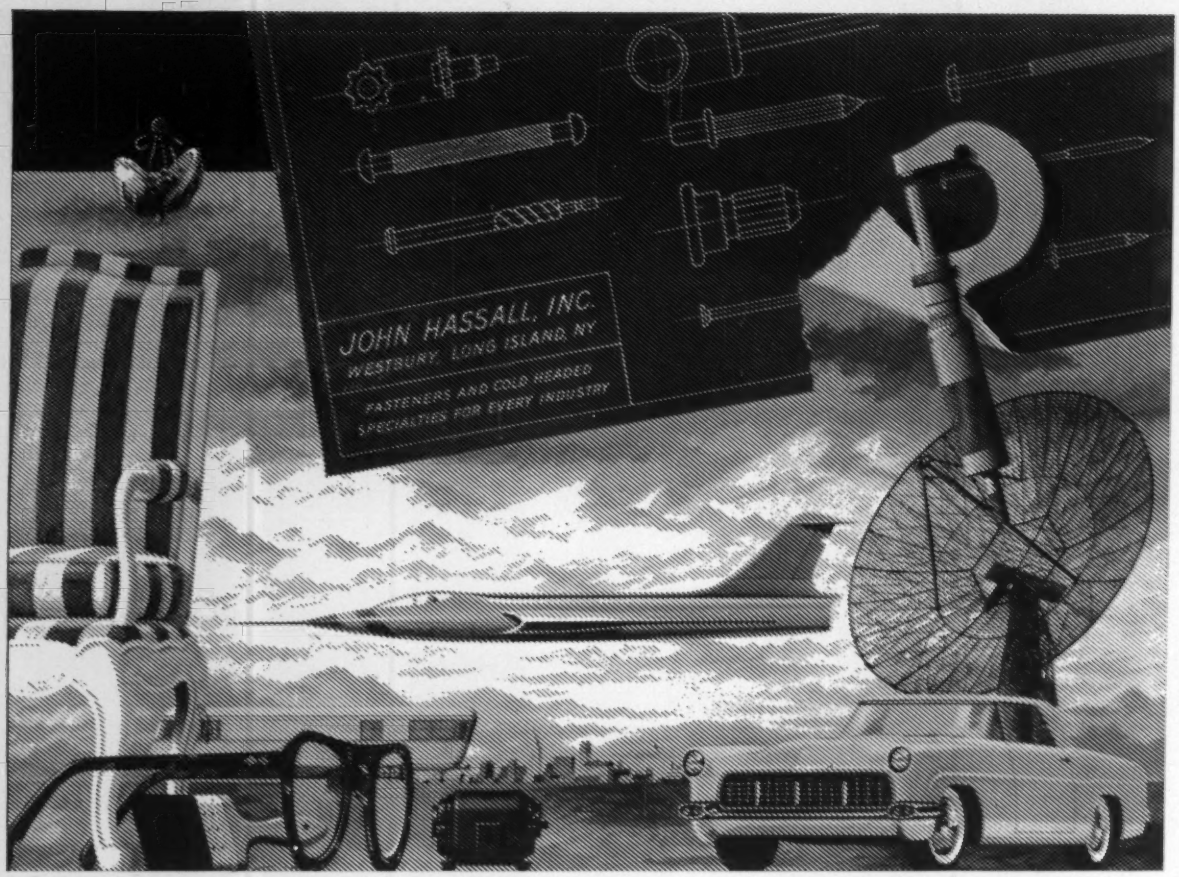
How General Electric performs as "one-source" supplier for your complete heat treating line

Next time you have a heat treating problem, don't begin a time-consuming, frustrating shopping tour for heating system components. Instead, call in your General Electric heating specialist. Get all the answers from this one representative who becomes your direct contact for your complete package including furnaces, materials handling equipment, control, atmosphere equipment, and accessories.

Example: A large producer of malleable and pearlitic malleable iron castings reduced his annealing cycle from 144 hours to 48 hours and cut man-hours 50 percent with a modern General Electric system. This complete G-E installation includes 25 electric furnaces, crane equipment and structure, quenching system, switchgear, control, and traveling hoists—all co-ordinated with General Electric engineering aid into an economical, high quality heat treating line.

Relieve yourself of heating system engineering problems. Call in General Electric when you modernize or install a new heat treating line. Contact your nearby G-E Apparatus Sales Office for "added value" assistance. 721-34

GENERAL ELECTRIC



Job-Designed Fasteners for Every Industry

Here is a fast, dependable, low cost, quality minded source of supply for JOB-DESIGNED fasteners of all types, in any metal, to fit your own particular assembly problem. Recognize the fact that a fastener designed specifically to fill a seemingly complex assembly requirement can easily cost less than design modification to accommodate so-called standard rivets.

Assembly costs are a very major part of manufacturing expense. Most of this is labor. The fastening medium itself is usually a minimum item. If a Job-Designed fastener makes assembly simpler and faster, permits the use of fewer fasteners, allows the designer functional freedom and improves product efficiency, yours is a purchasing job well done.

All these possibilities are available when you come to Hassall for design assistance and quotation on challenging, difficult or unusual rivets, threaded nails, drive screws and other cold headed parts. Short or long runs, pilot quantities, engineering counsel, over 100 years of intimate association with cold heading—and a deep appreciation and regard for the concept of value analysis—all are a part of the Hassall service to you.

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STEEL SERVICE CENTERS ARE STUDYING THE THREAT offered by fast service from mills. Also, according to one warehouse official, mills are taking over much of the volume business that formerly went to distributors. Some officials wonder if past notions of the warehouse market may have to be reviewed.

LOOK FOR AN UPSURGE IN MERGERS IN THE MACHINE TOOL FIELD as more builders seek to cut overhead and realize the advantages of greater diversification.

GROWING ELECTRIC HEATING EQUIPMENT MARKET draws interest of more manufacturers, according to a survey of the Dept. of Commerce. In 1959, a record $27.8 million in shipments of permanently attached units was rung up by the industry. A total of 13 manufacturers who did not make electric heating equipment in 1959 plan production in 1960.

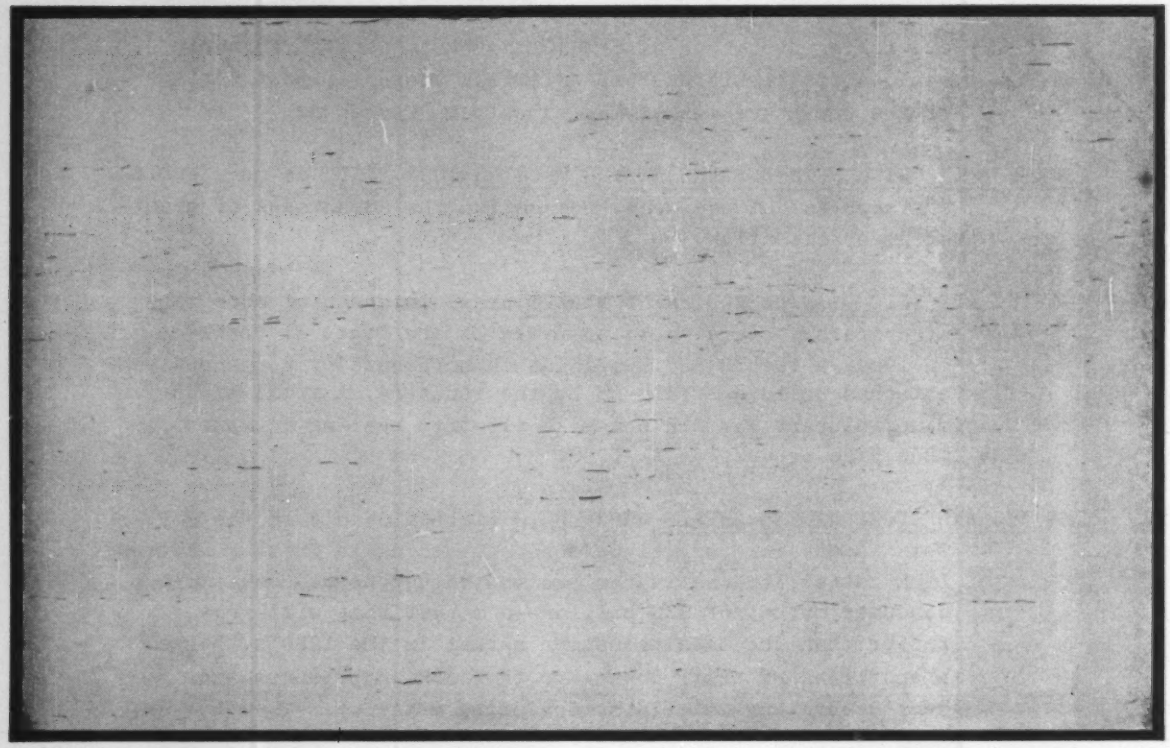
THE "65 AND OVER" MARKET SWELLS to some 16 million people in the U.S. This is one in every 11 persons. According to Chase Manhattan Bank letter, the estimates are that older people make up a consumer market of $30 billion--a market that will grow faster than the total consumer market in the 1960's. Large proportions of their income go to tools, appliances and home decorating materials, including metals.

STATE AND LOCAL GOVERNMENT PURCHASES SHOW RISING TREND. Seasonally adjusted annual rate rose to $46.8 billion for the second quarter of 1960. This expenditure for goods and services represents the peak of a steady rise that places state and local buying near the Federal mark. While Federal purchases have stabilized, those of state and local sources have continued to rise.

ELECTRIC UTILITIES CONTINUE FAST EXPANSION. The Edison Electric Institute reports that 70 pct more generating equipment was ordered in the first half of this year than in the same period last year. Boiler orders were 97 pct higher, hydraulic turbines were up 212 pct, and power transformer orders rose 96 pct.

SALES OF MATERIAL HANDLING EQUIPMENT RISE to highest point since June, 1959. The index of the Materials Handling Institute shows dollar volume reported by manufacturers in June at 160.2 (1954=100). This is up 10 points over May.

Why this steel costs less to machine...



100 X

YOU'RE looking at a photomicrograph of Timken® steel that has been resulphurized to give better machinability. Those sulphides you see in the picture interrupt the chip flow, giving shorter chips and faster machine speeds.

And you get this better machinability without any sacrifice of surface quality or mechanical properties when you buy Timken resulphurized steels. Small amounts of carefully prepared sulphides are added to the molten steel under exact conditions of time and temperature. The result: Tubes or bars with good surface quality, good physical properties, and substantially improved machinability without the disadvantages sometimes found in free-machining steels. And when you buy Timken fine alloy steel, you're assured of uniformity from bar to bar, heat to heat, and order to order.

If you're looking for a way to reduce machining costs on parts made from seamless tubing, bar stock, or forgings, call your nearest Timken Company sales office. Timken resulphurized steels are available in most grades of alloy steel. ***When you buy Timken steel you get . . .*** *1) Quality that's uniform from heat to heat, bar to bar, order to order. 2) Service from the experts in specialty steels. 3) Over 40 years experience in solving tough steel problems.* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

TIMKEN® *Fine Alloy* STEEL

TIMKEN ALLOY STEEL AND SEAMLESS STEEL TUBING ARE AVAILABLE FROM STEEL SERVICE CENTERS IN 44 CITIES IN THE UNITED STATES

Will Economy Correct Itself Without a Recession?

The way it looks now, business may be in for a severe correction. How severe is the question.

But the worst should be over in the spring of 1961. Then, a major upturn may be on the way.—By Tom Campbell.

■ The economy is now correcting itself. The correction, or recession, may be milder than either the 1954 or the 1958 cycles.

The reason why the man on the street has, so far, seen little to remind him of a recession is simple. The major areas affected—and to be affected—are manufacturing industries and markets.

Employment in retail establishments, in government, and in the service industries remains at peak level. Little or no change is expected there—yet. But unemployment and short time in basic steel and other industries depending on it are significant.

Balance Shifts—Over the years, manufacturing and mining have taken a smaller and smaller place in the overall economic picture. This trend continues. This, despite the fact that manufacturing pays the cost of most other areas of endeavor.

Most indexes of industrial activity passed their peak some months ago. Housing passed its peak last year and already is getting poised to start an upturn. The steel industry has gone through one of its most rugged experiences since the late 1940's. And it is not out of it yet.

Steel and Availability—The steel strike—preceded by an abnormally high steel rate—made it difficult late last year to gauge properly the

Business Outlook at a Glance

In this story, Editor-in-Chief Tom Campbell gives his detailed views on business prospects. Here are some of his capsule predictions:

Housing: due for an uptrend early next year. May go on to a new high rate by late 1961 or early 1962.

Steel: Going through the wringer. Seasonal upturn this fall may not be the real thing. Big turnabout will come next spring with the peak some time in June, 1962.

Defense: Up by at least $2 billion a year starting July, 1961. Could be more.

Deficit: In fiscal 1962, the government could have a stunning deficit, due to defense spending, housing legislation, farm payments, lower tax revenue, and anti-recession moves.

Recession End: The bad news should be over by the middle of next year for the professionals. The man on the street will see the change by Labor Day, 1961.

outlook for this year. Yet with most of the facts available it is now clear that some of the steel troubles were the same as in the past.

The ups and downs in steel have for the most part been tied to the availability factor—availability as to product and as to stable price.

In the current picture, both factors exerted substantial pressure as early as last April. Customers decided that the steel industry's capacity was large enough to take care of even hand-to-mouth buying. Also, they were working down a large steel inventory. Added to this was the gamble that the steel industry would not raise steel prices. A close reading of price statements by the U. S. Steel Corp. suggested to most purchasing agents that a steel price increase in 1960 was out of the question.

Like 1956 — This pattern—except for the influence of a "not steel price rise"—was about the same pattern which existed before and after the 1956 steel strike. The only difference has been an aggravation due to the longer strike, and the heavier buildup before and after the strike.

The steel industry will be over its recession pangs by next spring and will be starting up from the bottom into another fast moving boom that will not be over until the steel labor negotiations in June 1962 point the way. Long before that time, steel customers will start to rebuild their stocks just in case. Best guess on the date for this buildup to start is after Labor Day, 1961. Steel order volume, however, will show marked improvement long before that time.

Fall Upturn—The improvement expected in the steel industry during this fall will be mostly seasonal in nature: The upturn in orders will be due to auto steel orders for the new models and also due to the increase in general steel business after a widespread vacation shutdown in industry.

At any rate, the steel industry has been in a recession for a good many months. Its order volume is still on bottom and has been for at least two months. This bottom will be left behind within the next several months, but there is no indication of a strong upswing of major proportions in the near future.

Housing Outlook — Looking to some other activities which have had their effect on the economy, changes are in order. Home building is due for a start upward by spring. When that reversal starts, it will take along with it: Appliance sales, car sales, and the need—with a lag—for more suburban shopping centers.

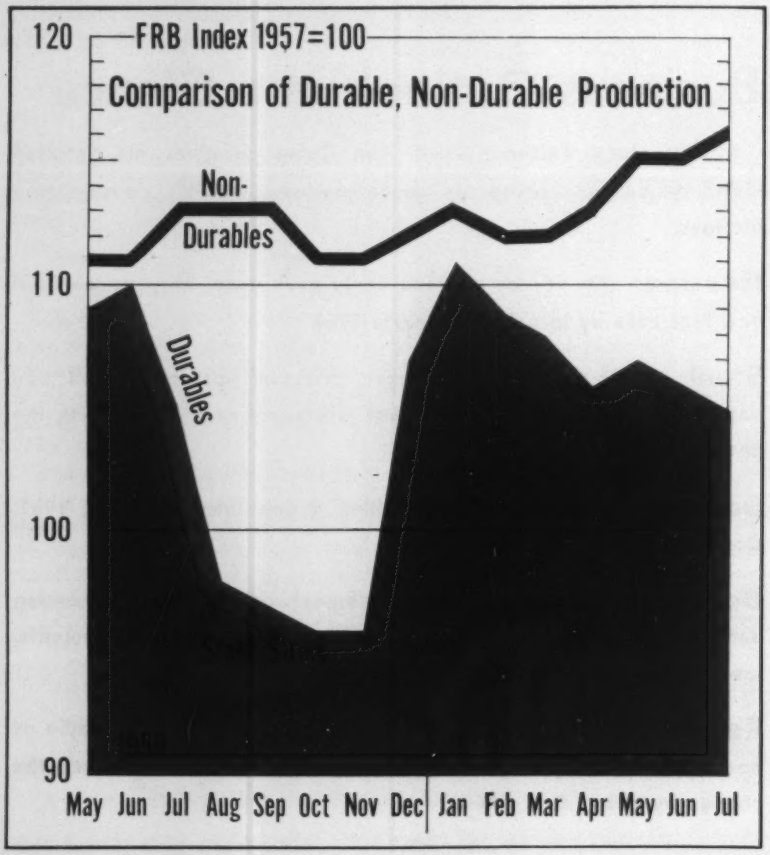
The housing boom will not take place over night. Starts, which this year will be somewhat under the corrected 1959 figure of over 1.5 million, will be on their way upward before mid-1961. From the present low annual rate of 1.3 million, it is entirely possible that by mid 1962 housing starts may be reaching a new high of more than a 1.6 or 1.7 million annual rate.

Capital Spending — New plant and equipment spending this year probably will reach the overall estimate of $37 billion. But next year, it will probably decline to some extent. It is unlikely that such spending next year will drop as low as it did in 1958 when actual spending was hardly more than $30.5 billion.

Other economic factors are in the picture which insure an industrial boom starting late in 1961, and progressing through to 1963. While this appears to be far ahead, signs of what is coming are not hard to find.

Factors to Consider—The major push to business will come after the election. The successful candidate will probably take anti-recession action. Coupled with this will be a much faster tempo in defense

Non-Durables Support Economy



spending. A moderate estimate on defense spending means at least $2 billion more each year than has been spent in each of the past two years.

Two major industries will be heard from next year also. The oil and gas industry has been depressed for more than a year.

Oil companies will have to buy more steel and other materials, if for no reason than that their inventories are about as low—zero in some cases—as they can get with economic comfort.

Transportation Needs—The nation's carriers will have to make up for the rails, the cars, and the other replacement items which they did not buy this year. The stepup in industrial activity next year will make this possible by an increase in railroad revenues. In recent years, the roads have curtailed purchasing in line with the drop in revenues. And because they have been among the last to see improvement, they have usually been the last to buy at an accelerated rate.

Price Predictions—This year, the probability of a steel price increase in December—after a wage increase goes into effect—is small. But the chances of a steel price increase sometime next year are greater than 50-50. When and if a steel price change comes next year, it will touch off a flock of price changes in items made from steel. These are changes that were not made this year because many manufacturers either had nothing to pin them on or competition was too rugged.

Probably the current market for machinery, for services, and for materials such as steel, represents the lowest that will prevail until prices start upward next year. It is probable, however, that labor will not get the kind of raises in the basic industries that it has obtained in the past. But there will be wage increases coming along. With the squeeze on profits which has occurred recently, it looks as if there will be price increases all along the line in manufacturing next year.

Materials Research Gets U.S. Funds

New and improved materials have been a critical need for the U. S. in the space race.

Now university researchers have been given the funds to tackle the problem; more grants are planned.—By C. L. Kobrin.

■ Since the advent of the space age nearly three years ago, the cry for new and improved materials has been increasingly loud. Now a move is being made to muffle those groans.

The Dept. of Defense has awarded research contracts totaling almost $14 million to three universities. Contracts went to Cornell, Pennsylvania and Northwestern. These universities have already been engaged in materials research and the new allocations allow for study expansion. Six more schools will be added to the program before the end of 1962.

For All Phases—This extensive research program will study all phases of metallurgical engineering, solid state physics and inorganic chemistry, according to Dr. A. N. Hixson, asst. vice president for Engineering at the Univ. of Pennsylvania.

One feature of the program is called "inter-disciplinary labs." The Advanced Research Projects Agency desires to see cooperation and cross-fertilization of ideas between departments. More common seminars and discussion groups will also be held.

In this way it is hoped that the program will break down the previous scientific communications barrier.

Large and Long—There are some unique features regarding these contracts. The money involved is large. The length of the contract is long. Usually, research contracts to schools range from $10,000 to $60,000. Normally, they must be renewed annually.

For the Univ. of Pennsylvania, the contract is slated to run for four years. It will total $4.4 million, and probably end up covering nearly 10 years work.

Advantages are numerous. Now the universities can plan for the future of the projects. Money is available to buy equipment too costly under normal programs. Also, the equipment can be used by all the departments concerned.

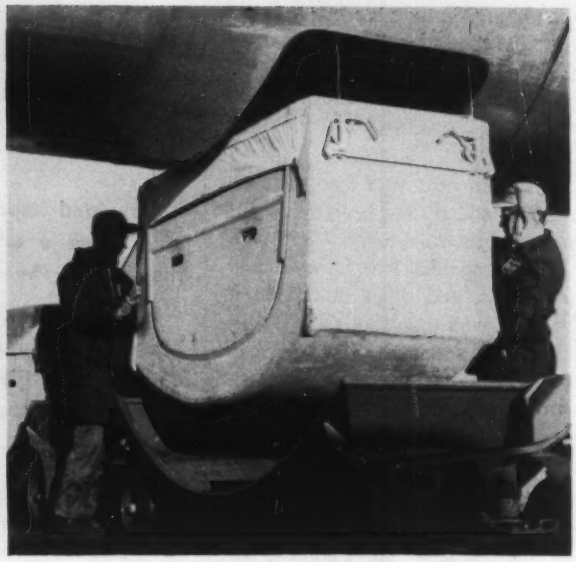
Machine Needed—The Philadelphia school plans to purchase several special machines. Among these are a high-strength, 100,000 gauss magnet; electron microscopes, a mass spectrograph, X-ray facilities, and units for growing single crystals.

To house these new facilities, a three-story building will be constructed on the campus. The balance of funds goes into staff personnel.

The new facilities are more than two years from completion. Nevertheless, studies have already started on low temperature materials and several other phases.

Trained Personnel — Another interesting point is that numerous people will be trained in this study as the result of the project. At the Univ. of Pennsylvania, for example, the school of metallurgical engineering will expand to 15 professors and 72 graduate students. Another 77 researchers will be added to the other phases of the study.

Through this program, the government profits in two ways. The basic research is performed and the need for scientists eased. Moreover, the program is valuable for educational institutions as a group.



HANDLING BOTTLENECK: Despite extensive use of conveyors and the development of cargo capsules, fast, efficient handling of air cargo remains one of the industry's biggest bottlenecks.

Air Cargo Grows, So Do Problems

Additional Cargo Space and Lower Rates Predicted

Aviation men are planning on large air cargo fleet expansions in the next five years. Some rates are already down and others will be.

The problem now is to revise ground operations to cope with the increase in cargo. — By K. W. Bennett.

▪ Air cargo, aviation's stepchild, is finally growing up.

The signs of the growth will appear in lower rates, additional space and extended services. All of this should mean happier—and more—customers.

At a recent air cargo meeting in Chicago, Flying Tiger vice president F. B. Lynott said that 10 Canadair turbo-prop planes will be added to the Flying Tiger cargo fleet this year.

Mr. Lynott predicted: "With this type of plane, we can price our services from today's rate of 19¢ per ton-mile to 6¢ to 8¢ per ton-mile coast-to-coast." He expects a 35 pct cut in ground handling costs and 16 hours of plane use daily.

Doubling Fleets—Anticipating a 4 to 6 times growth in air cargo during the next five years, some major lines will be doubling cargo fleets this year. American Airlines, Inc., for example, will have 15 DC7F's converted from passenger to full cargo use.

Other lines are also jumping into the act. United Airlines, Inc. is adding six propellor-driven DC7A's to its cargo fleet. Trans-World Airlines, Inc. has seven cargo ships and will order more. Riddle Airlines, Inc. plans to add at least three British-built turbo-prop planes.

Reduced Rates—With all of this, aviation men see a uniform reduction in rates. Already, rates for international air freight have been cut 29 pct. A cut of 5¢ per ton-mile in domestic freight is expected.

And because of lower rates and additional space, will come the growth. S. H. Brewer, Univ. of Washington, estimates a 30 pct per year growth in international air freight. He looks for a 20 pct growth in domestic air cargo.

His forecast for 1960: 750 million ton-miles. 1961 should result in 1.1 billion ton-miles. This is compared with the 595 million ton-miles of 1959.

Problems Also Come—With the upswing in air cargo capacities, however, come problems. Dock space is either inadequate or poorly designed. And systems for keeping track of pallets and freight containers are breaking down.

What this really boils down to is a need for systems engineers with transport background. Also, the air freight container field is wide open.

Democrats Plan Pricing Pressure

Platform Calls for Action Against "Administered Prices"

Pricing practices in auto and steel industries would get special attention from a Democratic President.

It would probably be "unofficial" Government participation in labor negotiations and price changes.—By R. W. Crosby.

■ The new Democratic hierarchy will attempt to "restrain" the so-called "administered price" industries.

This means, mainly, the steel and auto industries.

Advisors to Presidential candidate John F. Kennedy say party leaders will back policies and legislation aimed at major industries which they contend set price patterns without following supply and demand patterns of the economy.

In fact, the Democratic party's 1960 platform contains a plank which promises "action to restrain 'administered price' increases in industries where economic power rests in the hands of a few."

Government Negotiations—Asked by The IRON AGE just what this means, Kennedy advisors were quick to say it was no threat to push for "control" legislation.

A Kennedy spokesman said he expects the candidate's action would be something like that taken by his opponent, Vice President Richard M. Nixon, in the recent steel strike negotiations.

Kennedy, if he were elected President, would suggest Administration participation in labor bargaining to "arrive at anti-inflationary understandings." He indicated this would be one way they would attack "administered price problems."

Platform Plank — Rep. Chester Bowles, (D. Conn.,) a top man on the Kennedy team and one of the architects of the party platform, agrees.

Public hearings to show the position of industry and labor on price increases is one aspect of the plank, a Bowles spokesman said.

The plank is a statement of support for legislation now before Congress and for the work of Sen. Estes Kefauver (D., Tenn.). Principal sponsor of the bill (S. 2382) is Sen. Joseph Clark (D., Pa.).

It would require the President to set up a wage-price study group. The group would hold hearings on any proposed or actual price increases which the President rules appear to threaten national economic stability.

No New Hearings — The group would also hold hearings on wage increases and their relationship to price when higher pay is claimed by a firm as the cause of price boosts.

But legislation is not really needed to implement such a group. The President can appoint such an advisory committee. Sen. Kefauver has been the champion of government intervention into industry pricing policies. However, no new hearings are planned into steel industry pricing policies at this time.

Gun Is Cocked—But the hearing gun is cocked for any steel industry price hikes this year or next.

Earlier this year in a letter to Sen. James O. Eastland, chairman of the parent Judiciary Committee, Sen. Kefauver wrote:

"Because the steel industry is so important to the American economy, the subcommittee feels that it must continue to observe and study the administration of prices in this industry and, possibly, hold further hearings on any possible price advance which may occur as a result of the recent settlement entered into by and between labor and management."

PLATFORM ARCHITECTS: Sen. John F. Kennedy and Rep. Chester Bowles played key roles in building Democratic party platform.

Oxygen Becomes a Big Industry As Industrial Use Mounts

During the next two years, at least eighteen new oxygen plants will be built for the steel industry.

The big question: Should the mills buy the product from others or build plants themselves.—By G. J. McManus.

▪ Oxygen and steel industries are rapidly moving closer together—despite some question as to who is taking over what.

At least eighteen major oxygen plants will be built for the steel industry over the next two years. (See table below.) These will add about 6000 tons a day to the oxygen supply available to steel mills. They will double current capacity and put steel far ahead of the chemical industry as the nation's biggest user of tonnage oxygen.

Growth Record — Behind this growth is the fact that oxygen has become a major ingredient in steelmaking processes. In 1946, mills were using 65 cu ft of oxygen per ton of steel produced. In 1956, they used 190 cu ft per steel ton. This year oxygen usage is estimated at 420 cu ft per ton.

These broad figures don't begin to measure the full impact and potential of steelmaking oxygen. Taking a wide slice of the industry, use of oxygen in openhearths is averaging about 180 cu ft per steel ton. However, the big, modern openhearths are running anywhere from 500 to 700 cu ft per ton.

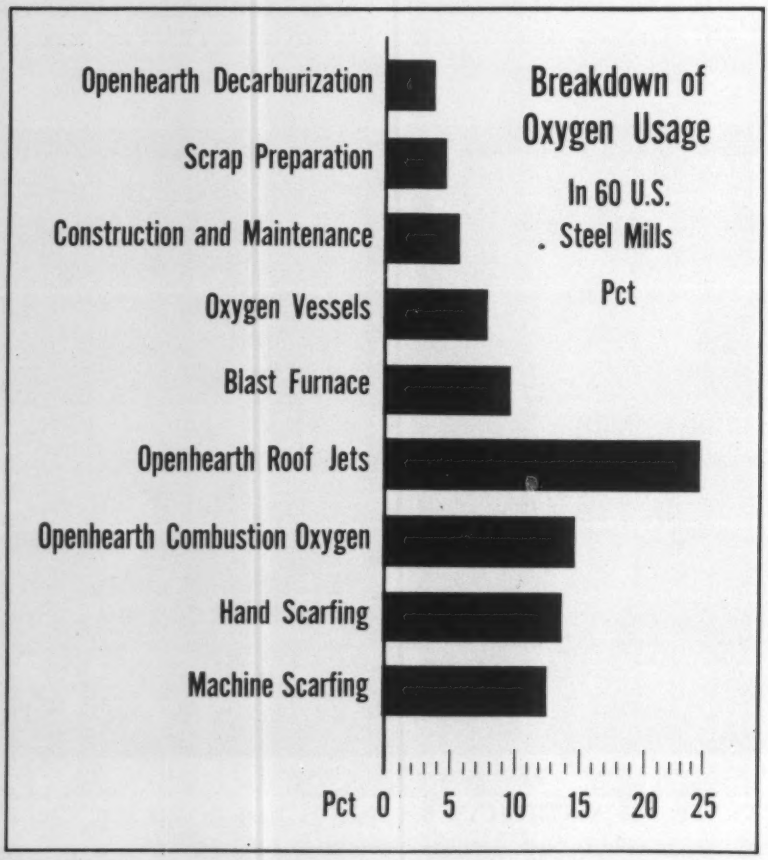
Triple or More?—Basic oxygen vessels are taking 1700 cu ft per ton. The same consumption rate is being tested for openhearths in new systems of gas and oxygen injection (The IRON AGE, July 28, p. 75). Blast furnace enrichment (now about 40 cu ft per steel ton) figures to become increasingly important as new mixtures of fuel and oxygen are tried.

All in all, suppliers estimate consumption of oxygen by steel mills will at least triple in the next five years. More bullish forecasters see a sixfold increase. All these predictions could turn out on the low side.

Increases Output — Here's why: Before current oxygen practices were adopted, a good openhearth would make about 30 tons of steel an hour. Using oxygen today, the better shops are making close to 40 tons an hour on a regular production basis. With the new injection techniques, openhearths have made over 100 tons an hour on a test basis. Basic oxygen vessels are making 100 tons an hour now and are expected to hit 200 tons when larger furnaces are installed.

In the case of openhearths, oxygen gives increased efficiency and capacity with very minor modifications. Basic oxygen vessels combine high efficiency with low capital costs. These factors point clearly to some type of oxygen enrichment for all major steelmaking processes. It is no exaggeration to say oxygen

Where Steelmakers Use Oxygen



Oxygen Facilities Expansion Is Underway

New Plants Scheduled	Capacity (Tons per Day)
Linde Projects	
U. S. Steel Corp. Duquesne, Pa.	1000
Colorado Fuel & Iron Corp., Pueblo, Colo.	360
Armco Steel Corp.	
Middletown, O.	140
Houston, Tex.	140
Detroit Steel Corp.	
Portsmouth, O.	310
Additional Locations	
Alabama	80
Chicago	140
New York	360
Ohio	310
Pennsylvania	200
Air Products Projects	
J. & L. Steel Corp.	
Pittsburgh	340
Cleveland	580
Weirton Steel Co., Wheeling, W. Va.	650
Granite City Steel Co., St. Louis, Mo.	170
Bethlehem Steel Corp.	
Sparrows Pt., Md.	350
Air Reduction Project	
Bethlehem Steel Corp.	
Johnstown, Pa.	675
Linde-Frankl Project	
Ford Motor Co., Dearborn, Mich.	
(to be built by Dravo Corp.)	280
Hydrocarbon Research Project	
Wheeling Steel Corp.	
Steubenville, O.	400

is revolutionizing the steel industry.

Who Handles the Job?—From a standpoint of oxygen supply, implications of this revolution have yet to be nailed down. Authorities agree oxygen plants must now be regarded as standard utilities for steel. But it is not entirely settled just how these facilities will be arranged and who will work them.

The big gas producers are united in the view that oxygen is best handled as an external utility, with the mills buying product rather than plant. Linde Co. and Air Reduction Co. have always taken this position. Air Products Co. started out as a supplier of either plant or product. In recent years, however, Air Products has gotten away from equipment sales for steel applications.

Supplier Arguments — The gas people offer strong reasons why oxygen plants should be owned by themselves rather than the steel mills. They say supplier ownership gives the mill its oxygen supply with no capital investment. In this connection, earning rates of supply companies are cited as evidence of the low investment return from oxygen plants.

A second argument runs this way: Oxygen requirements have been increasing rapidly and are hard to predict. Even if average loads are known, there is the problem of providing capacity for peaks. Finally, mills must provide capacity for protection against unexpected breakdowns of oxygen facilities.

Backup Services Provided—Suppliers contend that ownership by the suppliers reduces all these difficulties. Linde points out it can supply oxygen for volume tests. This service enables a mill to determine requirements before making commitments. The company also says it offers contracts that guarantee 100 pct or 50 pct backup of on-site facilities. Under this arrangement, says Linde, breakdowns are strictly a supplier worry. Backup plants also provide a reserve for abnormal peak requirements, says the company.

In line with this thought, the major suppliers are building up systems of central supply in steel centers. Linde now has capacity to produce 2000 tons a day of oxygen in liquid form at central stations. Air Products recently installed a 230-ton liquid oxygen plant near Pittsburgh. Airco has 350 tons of liquid capacity at its plants.

Central Supply Source—The idea of a central source may be carried a step further in the near future. Linde has built one 1000-ton plant to supply oxygen for a group of mills of United States Steel Corp. near Pittsburgh. Oxygen will be piped from the one big plant to the using mills.

This gets away from the on-site concept for tonnage oxygen. For Chicago, Linde has been studying an even more sweeping departure. Plans under consideration call for a plant with a capacity of 4000 to 5000 tons. This would supply not just one company, but a group of companies. Whether the advantages of volume production would offset the cost of pipeline transportation has not yet been decided.

Value of Experience—Also not fully decided is the question of whether oxygen generation is an operation completely foreign to steelmaking. Suppliers argue that it is, that gas production is alien and incidental to metals men. On the other hand they say their own organizations are centered on gases. Thus they have the advantages of specialized skills, consolidation of

replacement parts, and prime interest.

For the most satisfactory operation of a modern oxygen plant, they say it makes sense to have oxygen men as owners.

Mill View—This idea seems to have been pretty well accepted by the mills. Of the 18 new oxygen plants now scheduled, only one (Ford's) will be owned by a steel company. Jones & Laughlin Steel Corp., which has operated its own oxygen plant at Pittsburgh, will buy gas for Cleveland from a new 580-ton plant of Air Products Co.

However, there are those who dispute all the arguments in favor of supplier ownership. Prominent in this camp is Dravo Corp., which recently negotiated an agreement to build oxygen plants of the Linde-Frankl type in this country. A few weeks ago, a 280-ton plant of this type was purchased for the steel works of Ford Motor Co.

Another Approach—Dravo maintains that a steel mill must pay the cost of all the oxygen it gets whether the gas is provided under a supplier contract or from a plant owned by the mill. The only difference, says Dravo, is that a contract price involves outside profit while mill ownership does not.

Dravo maintains this difference is significant. A company official estimates a tonnage oxygen plant can be built for as little as $12,500 per daily ton of capacity. For a 300-ton plant, Dravo says this can mean an oxygen charge as low as $8.20 a ton.

Operating Questions — Finally, Dravo feels there are no great technical problems involved in mill ownership. The company says its own system is relatively simple and closely related to the turbo blowers of blast furnaces. For low purity gas, the oxygen plant can be treated as a blast furnace auxiliary rather than a major independent unit, says Dravo.

Similar views are expressed by Chemical and Industrial Corp. of Cincinnati.

Reynolds Adds Huge Soaking Pits

FIRED UP: Fourteen new soaking pits, capable of holding some 2300 tons of aluminum ingots up to temperatures of 1150°F are now in use at Reynolds Metals Co.'s Sheffield, Ala., alloys plant. The gas-fired soaking pits, designed and built by the Rust Furnace Co., can handle ingots as long as 200 in. and weighing up to 34,000 lb. They are for use in readying large ingots for rolling into plate and sheet on the world's largest aluminum rolling hot line.

USWA: U. S. Steel Hit By Railroad Strike

About 24 pct of U. S. Steel's capacity was idled last week by a strike at the corporation's subsidiary railroad, the Union Railroad Co.

With the railroad owned by U. S. Steel and run by members of the United Steelworkers, the strike departed from conventional rail labor patterns.

Generally, strikes of this kind are settled quickly and severe shutdowns are avoided. This could still be the case. But as the strike got under way, talk from both sides was of a tough nature.

Generally, the union wants the same benefits gained by Steelworkers in the last negotiations. But the company said the contract offered the union had been accepted by the Brotherhood of Locomotive Engineers and contended it could not pay one group of railroad employees more than another.

Meanwhile, U. S. Steel's customers served by the Pittsburgh area mills took stock of their inventories.

Producers Concentrate On Upgrading Ore

Despite a slow year in the iron ore business, the drive for product upgrading continues in the Lake Superior district.

Reserve Mining Co. at Silver Bay, Minn., Jointly owned by Republic and Armco Steel Corps., has started a $120 million program to expand iron ore concentrating facilities. Pelletizing capacity will be increased 50 pct from a present 5.5 million tons annually to 9 million. A second 47-mile rail line will be built to the crushing plant.

In upper Michigan, Cleveland Cliffs Iron Co. and its partners are expanding capacity from a present 650,000 tons to 2.25 million tons.

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Rock Falls, Illinois

SCOVILL MANUFACTURING CO.
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SHAKEPROOF DIVISION, ILLINOIS TOOL WORKS
Elgin, Illinois

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The Pressure Will Keep Growing

Management featherbedding will get short shrift in the now de-sizzled 1960's.

In the drive for sales and profits, managers must give maximum effort, using new techniques and new ideas.

■ It's clear now that most of the soar in the Sixties will be put there by sober thought and hard work.

In the competitive struggle, the premium will be on management productivity. Old methods of operating and outmoded thinking won't be enough to keep your company on top.

Your managers will be faced with more decisions on complex issues. Management featherbedding — at any level—is a luxury you can't afford.

Weeding Out—The heat is already on. And it will get more intense. The growing number of management shifts in recent months prove this is so. There has been some weeding out of management men whose approach is obsolete.

With profits on the skids, despite rising sales in many cases, every business cost is getting careful attention. Under suspicion is every action, decision, or plan that costs more than it should—even if okayed by the top men.

This has already reduced the number of secretaries, clerks, and paper work per department. Some steel sales offices, for example, are paring down staffs.

Faster Pace—But it goes deeper than cutbacks. The aim from now on will be maximum productivity from middle and top management.

And sound management in the Sixties will demand the utmost in effort. Swift changes make the job more difficult. Developments in science and technology can quickly make or destroy markets and distribution patterns.

The growing world trade struggle, the rise of trade blocs, are expanding the area where business action takes place. Decisions on producing and marketing can't be made solely on the basis of the U. S. market. And, in addition, the increasing threat of the Communist bloc must be considered.

People, Prices, and Production—Even the area of human relationships at home calls for more from today's manager. Despite the impersonal nature of business, there's more stress on the part the individual plays.

Other problems concern efforts to hold down rising costs in a market where price increases are difficult. The growth of industrial capacity puts more emphasis on effective distribution and fast delivery.

All this points up the need for more and better management training.

How Much Swing to Services?

■ Your markets are affected by the growing swing from goods to services.

But how fast is the change moving? And in which areas is it greatest?

Some interesting ideas on the swing to services are advanced by The Morgan Guaranty Trust Co. in its latest business survey. First, there is the apparent paradox that consumer spending patterns have actually changed very little in the post World War II period.

Prices Played Part—The percent of the consumer's dollar going for services did advance from 31.1 pct in 1947 to 39.1 pct in 1959. But most of this is explained by price increases. The cost of services was rising faster than the price of goods.

In some cases, the trend was even in the opposite direction. For the family which stayed away from the movies to watch television, there was a drop in admissions charges.

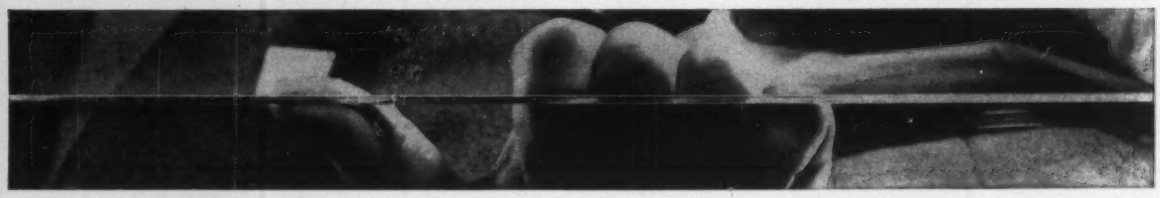
Built-in Services—The answer to the paradox is this: Many of the goods bought now have a large degree of service built into them. Although the consumer eventually pays for them, he does not purchase them as services. Examples include: Processed food, retailing costs, financing, and transportation.

Strong Growth in '59

U. S. economic growth last year was at a rate of 7 pct, according to an administration spokesman, Don Paarlberg, special assistant to President Eisenhower.

This was considerably larger than the average annual increase of 3 pct during the last decade.

Sees $4500 annual screw saving



RB&W fastener survey uncovers use of special item which is replaceable by standard hex screw at much less cost

Of course you pay more for a "special" than a "standard" item—and that includes fasteners. So, when surveying a company's usage of fasteners, the RB&W Man looks sharply for the "specials"—and a valid reason for their use.

He could find no good purpose for the extensive use of screws with heavy head and milled body in one particular product. There was neither a specification requiring close fit in very close tolerance holes . . . nor were there exceptionally "sloppy" holes that called for an oversize head to span.

He therefore recommended assembly with standard RB&W High Strength Hex Screws. They would meet any physical requirement for the "special" being used... *but cost 30¢ less per unit.* Yearly total: $4500 more for *profits* instead of *costs.*

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AM's Romney Challenges Giants

He Says Ford and Chevy Must Become Compacts or Lose

Compact cars have come into their own. American Motors' president predicts they'll lead in production volume soon.

And he claims that today's volume cars will have to adapt to the trend.—By A. E. Fleming.

■ Within three years the car maker which builds the most compacts will lead the industry in production volume.

With this idea, George Romney, American Motors Corp. president, last week launched the auto industry's press preview season at a Mukwonago, Wis., resort site a few miles from the company's Burlington proving grounds.

Whether the theory of industry leadership via the compact route is solely Mr. Romney's, or whether it will be popularized in the next few weeks by officials of other companies, remains to be seen.

But straight-talking Mr. Romney made clear his thoughts when he said, "Perennial production leaders Chevrolet and Ford will become compact cars or yield their present positions by 1963."

A Handicap — He did not say Rambler will be the one to step into the top spot. But he suggested it would be a leading candidate. There is no doubt Rambler is currently at a disadvantage in challenging Ford and Chevrolet in production capacity. But AM would have it known it is taking steps to reduce the handicap.

A number of expansion moves will boost Rambler annual capacity to more than 600,000 cars as the 1961 model run begins. A $43 million expansion program was recently announced. Another $11 million outlay is in the mill and work is expected to begin in the coming year.

Equipment and Machinery— Most of the $43 million went into new machinery and equipment for Kenosha, Wis., facilities where Ramblers are produced. Something under $5 million went for land and buildings. Major improvements and additions include: New high capacity heat treating furnaces yielding an additional output of 144,000 lbs a day, greatly boosting axle output; a new cylinder block line with capacity of up to 100 blocks an hour; the industry's first fully standardized automated transfer unit which can machine cylinder heads at the rate of 120 an hour through 323 automatic operations.

A recently acquired body plant in Kenosha is ready for 1961 model output. Formerly owned by a metal furniture and bed maker, the plant is overhauled to provide added capacity of over 800 Rambler bodies a day.

Also announced is a new Engineering and Experimental Research Center which will concentrate on product development and improvement. Set to open Nov. 1, it will house AM's Wisconsin engineering staff, testing and research equipment and dynamometer rooms.

Full of Optimism—There seems to be no quenching the optimism Mr. Romney and his crew have become known for in the past three years. The company's sales aim for 1961 models, which enter dealer showrooms in mid-October, is a record 550,000 units. Sales in the 1960 fiscal year, comparing roughly to the model year, are expected to hit 450,000. Sales in fiscal year

A Bluebird Lands in the U.S.

JAPANESE BLUEBIRD: First 1961 model car to appear on the American market is the Datsun Bluebird. It sells for $1695 fully equipped. Koichio Asakai, Japan's Ambassador to the U. S. (left), takes delivery of the car from Soichio Kawazoe, of Nissan Motor Co., the automaker.

1959 were 363,000.

Along with growing sales comes growing dealer strength. There are 3010 Rambler dealerships now, and AM is "the only company to show an increase in the number of dealers in the past few years," says Roy Abernathy, vice president of automotive distribution and marketing. In 1958 there were 2196 Rambler dealerships accounting for 6 pct of an industry total of 37,188. Rambler now has 9 pct of a 32,800 total.

AM is giving its 108 in. wheelbase Rambler Six and V-8 a name in 1961, the Classic. Names of other Rambler lines, American and Ambassador, will stay the same.

Many New Fans — AM thinks the American may win the company many new fans in the coming year. The 100 in. wheelbase model, virtually unchanged the past 10 years, is completely redesigned. Generally it looks more like the larger 108 in. and 117 in. Ramblers.

But the 1961 styling of the American won't change for a long time, maybe another 10 years, according to Mr. Romney, and at least not in 1962 or 1963.

"In the case of the American, we'll follow the path of styling stability as we've already demonstrated," he forecasts.

Modified Styling—For the Classic model, a somewhat modified program of styling continuity will be carried out. "With this car we'll stay close to the mainstream of appearance popularity in the industry but without abrupt or whimsical change from year to year," Mr. Romney says. The Ambassador will also follow the course of modified styling continuity, but with increasing appearance differentiation between it and other Ramblers "to enlarge the margin of choice."

When Mr. Romney talks of styling, seemingly downgrading its importance, members of his styling department take on disturbed looks. "I'll say this though," he states, "styling for the perfection of line required for styling continuity is a lot tougher than just creating a new shape for the sake of change."

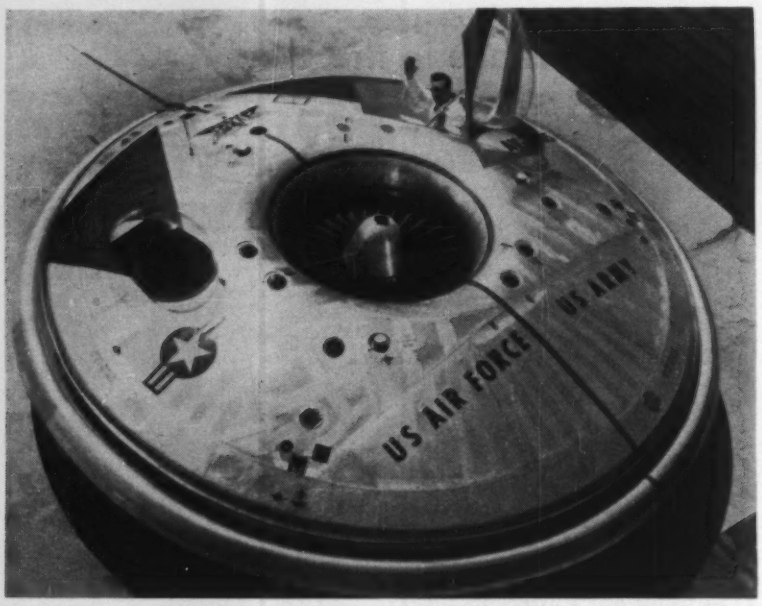
Styling for the compact concept called for new skills. Seeking to find just the right touch to make a compact look like what it is — a balance of the best—not too bulky, not too skimpy, takes the best skill there is in design and engineering.

1961 prices won't be announced until introduction week. But there was a slight hint of "price hike" in Mr. Romney's comments. "We've put more cost into our 1961 cars," he said. "Tooling for 1961 was higher than for 1960. As an offsetting factor our volume is up."

He added: "On the basis of product and price we'll offer the customer better relative product value this fall than in the past. But keep in mind labor and material costs are increasing."

Mr. Romney predicts between 6.6 and 6.7 million new cars will be sold in the U. S. in calendar year 1960, including a little better than 400,000 imports. He didn't forecast a 1961 figure, but said he did not agree with some of the pessimistic calculations which are circulating. (See International, P. 13).

Flying Saucers Are Real



THE PUSH INTO FUTURE: As part of the Army's push for modernization, the AVOCAR has been created. A research aircraft, it may some day be used as an aerial cargo carrier, for reconnaissance and the transporting of limited personnel. The craft was developed by AVRO Aircraft, Ltd.

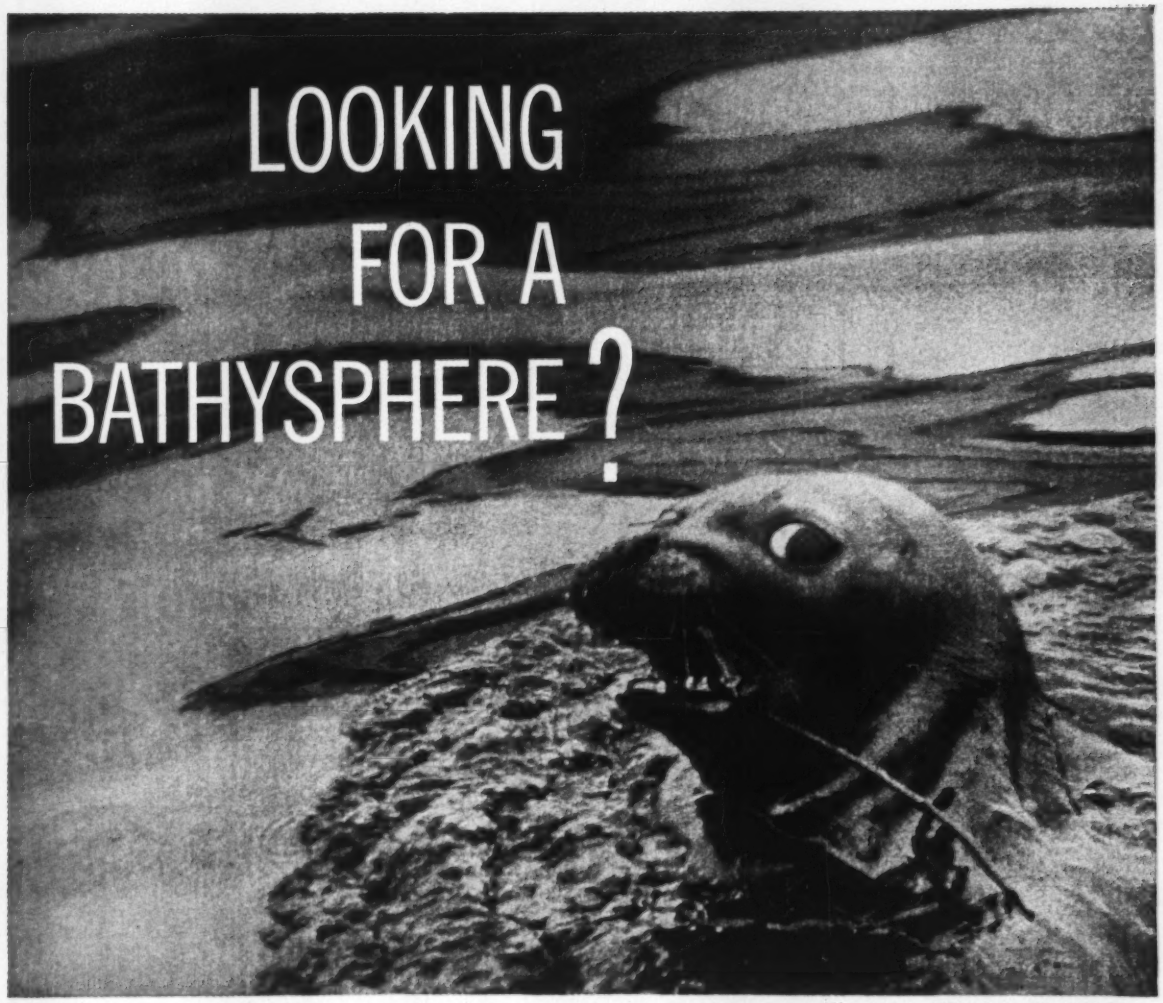
Ford Increases Engine Warranty

The auto industry's most complete and extensive warranty on gasoline engines went into effect Aug. 15.

Ford instituted a 100,000 mile or 24 month warranty on super duty truck engines. The deal applies to all major components of three Ford super duty engines available in 12 models of heavy and extra heavy duty trucks including tilt tandems.

"For the first time," says Wilbur Chase, Ford truck marketing manager, "dealers will be able to make prompt, on the spot warranty decisions for up to two years or 100,000 miles of service, the most liberal dealer adjustment policy."

Repairs meeting conditions of the warranty to heavy duty truck dealers can also be made by any authorized Ford dealer. Ford's previous warranty program on super duty truck engines was the same as cars, 4000 miles or 90 days.



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a spiral gear? or a pruning shear?

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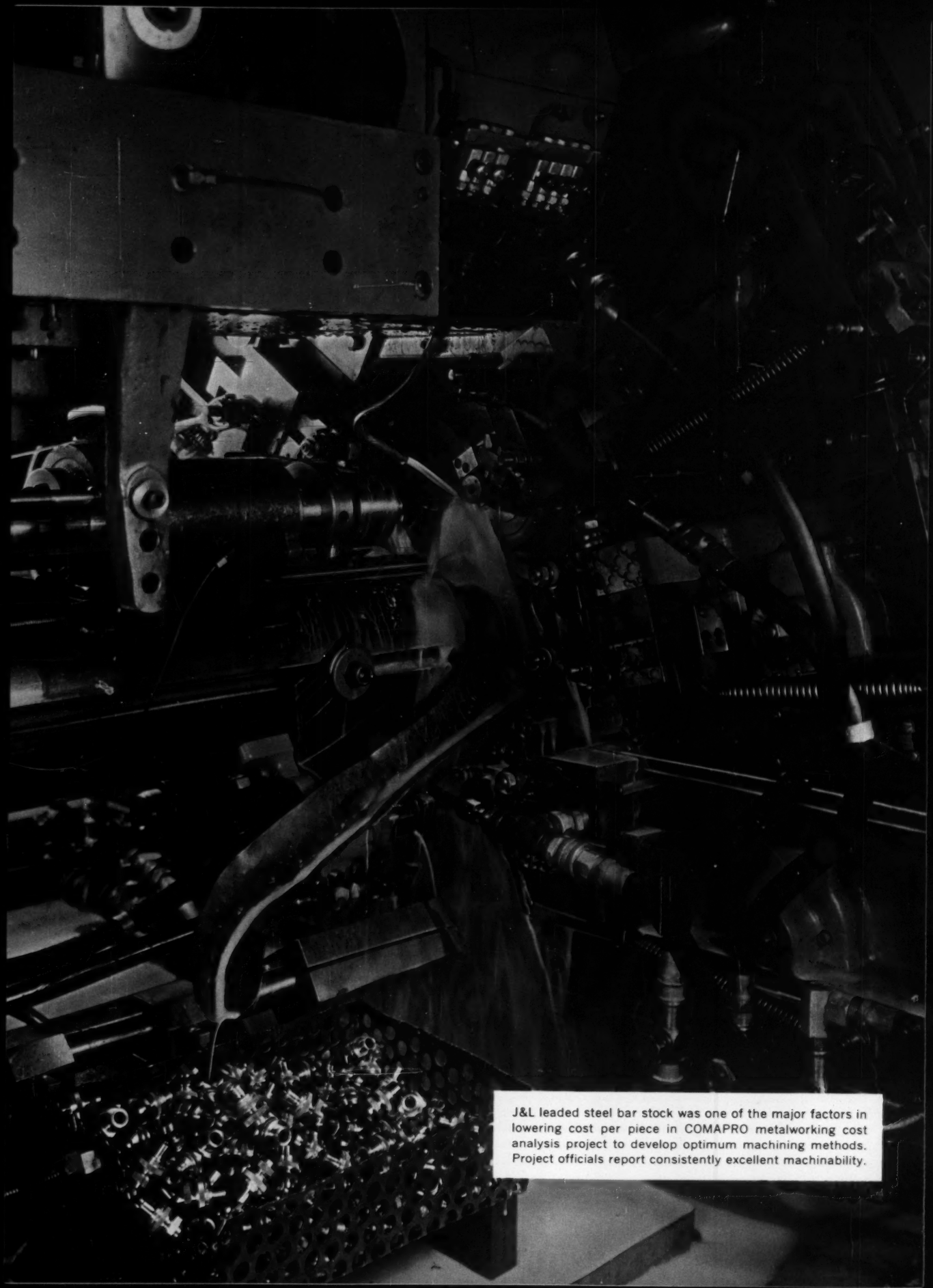


J&L leaded steel bar stock was one of the major factors in lowering cost per piece in COMAPRO metalworking cost analysis project to develop optimum machining methods. Project officials report consistently excellent machinability.

Final COMAPRO tests prove . . .

J&L leaded steel bars are a key factor in cutting production time 30%

Excellent machinability of J&L Type A leaded cold finished bars has been proved by the widely recognized cooperative machining program conducted at Cone Automatic Machine Company, Inc., Windsor, Vt.

COMAPRO's final report covered a period of many months of tests on the machining of spark plug shells under scientific laboratory-controlled conditions.

It highlights these important facts:

1. Production time per machined unit was cut from 6.5 to 4.41 seconds—a reduction of approximately 30%.
2. The tools of the automatic bar machine demand a degree of uniform machinability in the bar stock which J&L Type A leaded steel consistently provided.
3. The free machining quality of J&L leaded steel reduced tool changes.

These results are typical of the benefits many companies have been getting with J&L free-machining steels. In actual production runs, the use of J&L's Type A leaded steel has increased overall output rates 22%, reduced tool costs 50%, and has required less power than making similar parts of conventional steel.

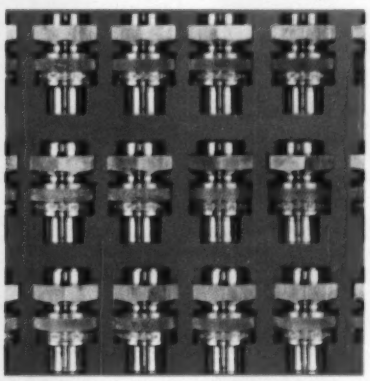
This Steelmark identifies products made of steel. Place this mark on your products. And look for it when you buy.

Steel

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Where cold rolled steels originated in 1859



Spark plug shells were selected as typical machined parts for COMAPRO tests. Note superior finish of completed units produced from J&L 1 3/16" leaded hexagon bar stock.

COMAPRO tests were run on this six-spindle Cone automatic bar machine which permits continuous end-to-end feed of bars from the reel into the machine.

New two-unit feed mechanism developed by COMAPRO provides quieter operation, longer tool life, stock savings, closer tolerances and other important advantages.

J&L STEEL

Six machining steps are required to produce the spark plug shell. Machining cycle time was cut 30%, due in large part to the fine machinability of J&L's leaded steel.

COMAPRO emphasizes well organized tool control; makes use of modern pre-set, quick-change type of holders, with gauges. Result: time for tool changes is greatly reduced.

PAUL BUNYAN'S BOWLING BALL PROVES BEARINGS!

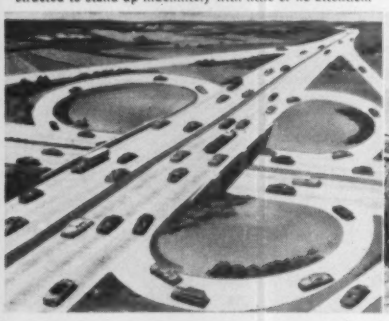
This game of tenpins would have been fine sport for Paul Bunyan, yet it would have taxed even *his* strength to clear as much as 50 acres an hour with this gigantic ball. Today, giant 'dozers do the job with ease. Nearly every leading make is equipped with Bower Straight and Tapered Roller Bearings – with proven ability to stand up under back-breaking pressure. Manufacturers look to Bower for improved bearing design and painstaking quality control that make Bower bearings last longer, need less maintenance. When you require bearings, select from Bower's complete line of tapered, straight and journal roller bearings for every field of transportation and industry. Bower Roller Bearing Division, Detroit 14, Michigan.

BOWER ROLLER BEARINGS

tapered cylindrical journal

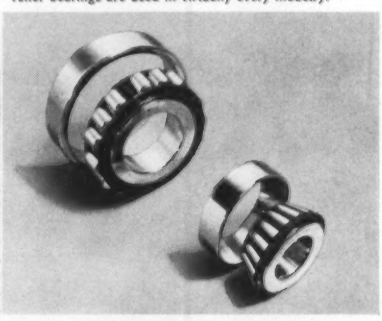
DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC.

AUTOMOTIVE. Bower roller bearings are designed and constructed to stand up indefinitely with little or no attention.



AGRICULTURE. Breakdowns in equipment are costly. That's why farm equipment makers use Bower roller bearings.

BOWER'S BROAD LINE of tapered, cylindrical and journal roller bearings are used in virtually every industry.



Natural Gas Is on the Move

New Projects Mean Metalworking Dollars

Natural gas industry facilities are growing at the rate of $2 billion annually.

This growth means more markets for metalworkers and additional sales. Some natural gas companies are testing aluminum pipe.—By R. R. Kay.

■ Work is starting on a $340 million pipeline to bring natural gas from Western Alberta, Can., through the Pacific Northwest to California. It is one of several construction projects in the natural gas industry.

These projects will mean millions of dollars in metalworking pockets.

Pacific Gas & Electric Co., San Francisco, is building the new pipeline. It is scheduled for completion in the winter of 1961-62. Several similar projects are already in the working stages and others are on the drafting boards.

Big Business—The natural gas industry is a business with $22 billion in plant investments. It's the nation's fifth largest industry and its facilities are growing at the rate of $2 billion annually. (See The IRON AGE, West Coast, April 7, 1960.)

Fastest growth for the industry is in the Farwest where the demand for natural gas keeps up unabated. For the immediate future, over $500 million and more than one million tons of steel are involved.

Another $200 million project is shaping up. It will consume 650,000 tons of steel. Also, agreements were just signed for a joint Mexican-U. S. 1240-mile, 34 in.-diameter gas pipeline.

Opening Up Markets—This plan involves Tennessee Gas Transmission Co. and Petroleos Mexicanos. They plan to bring gas from Texas and Mexico to the Los Angeles basin.

Once this project is underway, it will open numerous markets. There will be a need for pressure vessels, controls, engine generators, air compressors, boilers, radio communication towers, water wells and systems, steel buildings and fencing.

At the destination point, a network of small diameter pipe will be required.

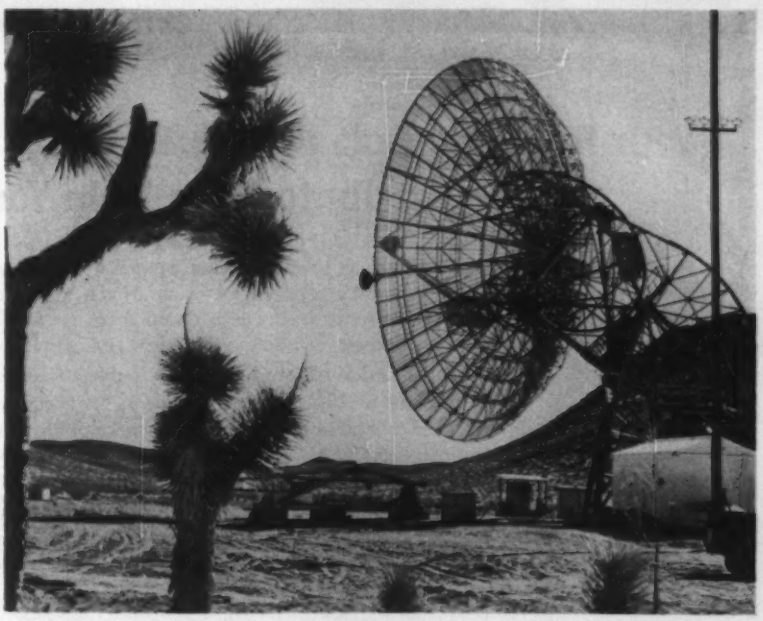
Immediate Needs — There are some metalworking products that are needed immediately. Among these are: Thin-walled pipe of higher yield strength, 40 in. or larger outside diameter pipe; and better piping materials for lower pressure applications.

Missile Plotting

Contract for two large-scale missile plotting boards for the Pacific Missile Range went to Computer Systems, Inc.

The two boards will be used to coordinate all firings and record data on missile performance.

Off Into Space and Back Again



PITCHER AND CATCHER: This is one of two antennas at the Goldstone Tracking Station, Calif. They are sending and receiving radio signals to and from an aluminum-coated satellite nearly 1000 miles in space. The antennas were designed and built by Blaw-Knox Co., Pittsburgh.

Your Republic Bolt and Nut Distributor Can Help You

How much time can you afford to spend keeping up on new fastener techniques? Time enough to read the dozens of trade articles published monthly on the subject? Time to study the complexities of space age fastening problems, and to talk regularly with fastener designers and engineers?

The point is, you can be well informed on these things without spending time and effort. Rely on the fastener expert who is already at your service—your Republic Bolt and Nut Distributor. He's constantly aware of all that's new and useful in the industry. And he and his staff are backed by the know-how of Republic Steel—a company whose fastener background spans a century.

Any information you might need is quickly available to you—part of your Republic Bolt and Nut Distributor's full-range service. You can count on him for fast deliveries of all types and sizes of fasteners, too—in whatever quantities you need. Call him today.

Call your local distributor for quick deliveries of...

REPUBLIC Bolts and Nuts

REPUBLIC STEEL

Transfer Line Shows Versatility

Four Sizes of Parts Are Handled Interchangeably

Creative machine design is paying off by continually broadening the uses for automation.

One new line performs a number of operations on different size parts.—By R. H. Eshelman.

■ New design ideas constantly broaden the scope of automation. Creative machine design sometimes means throwing away the book and forging new paths to greater versatility for these special lines. But the bold, original approach does pay off, reports J. H. Williams & Co., Buffalo.

With a new transfer installation, the plant is now machining four sizes of adjustable wrench handles on a single continuous line. The machine, designed and built by Colonial Broach & Machine Co., Detroit, is the first major transfer line built around internal and surface broaching.

Handles Four Sizes — Basically it's a pallet type, with each carrying four wrench handles. The pallets handle all four sizes interchangeably. Cycle time is under 30 seconds, and output is about 500 wrenches per hour.

Operations completely machine the wrench handles to close and uniform tolerances. Mating of jaws is so accurate, company production experts say, that no hand fitting is needed.

The line has a total of 14 machining stations—six multiple-operation type, eight devoted to broaching. At milling, drilling, reaming and tapping stations operations are performed from both sides. Last station does a multiple staking job.

Cycle Times—Surface broaching machines the jaw faces of the wrench body; internal broaching machines the worm hole. Other broaching operations are internal. Metal removal is in steps to equalize cycle times.

Since operations on the wrenches must be performed in different planes and at right angles, there are two 90° turnaround stations. At one the worm hole opening is broached to size. All working jaw faces are surface broached at the other. To maintain alignment and handle pallets, each has two sets of rail guides. These are at right angles and have different spacings.

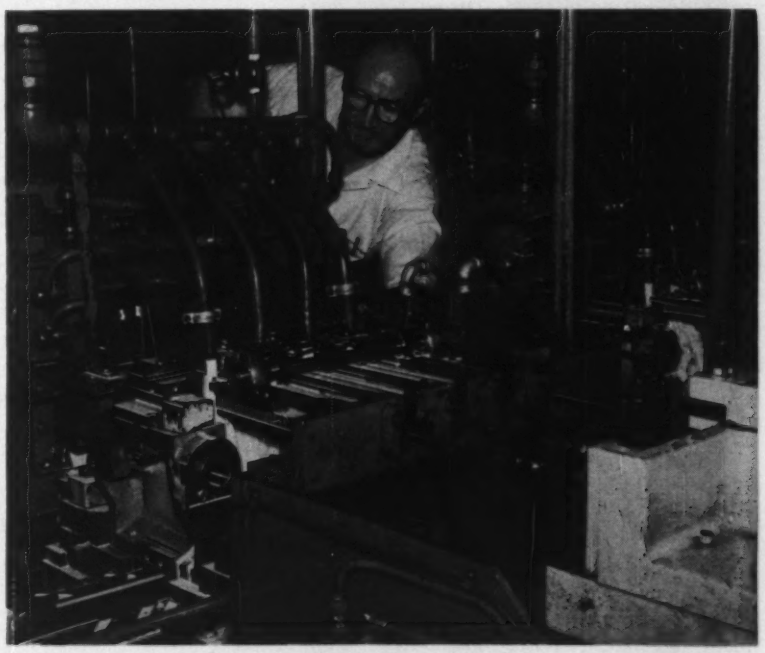
Tilting Pallets—Another processing problem is solved by tilting the pallets to broach an angular opening in the head of the wrench body. The work-holding fixture is automatically tilted to the correct angle before the broach enters the work.

Special precautions are designed into the machine to prevent damage from tool breakage. Operations are interlocked so that if a tool breaks the machine automatically stops. Shutdown is actuated by tool indicators. Other types of failure also bring automatic interruption of the machine cycle.

Marketing Trend

A new marketing trend is developing among machine tool builders —permanent factory displays.

Cone Automatic Machine Co., Windsor, Vt., for example, is setting-up new multiple-spindle automatics to show typical jobs.



BROACHING AUTOMATION: This machine, one of eight broaching stations in a 14-station automation line for machining four sizes of adjustable wrench handles, typifies new metalworking techniques.

INDUSTRIAL BRIEFS

$4.5 Million for Coke—Wheeling Steel Corp.'s No. 3 battery of 51 coke ovens at the Steubenville Works has been taken out of service. The rebuilding project will cost $4.5 million and will require 12 months to complete. The rebuilt coke ovens will be of the same type as the No. 2 battery of Koppers ovens installed at the Steubenville Works in 1954.

Expanding Facilities—Burg Tool Manufacturing Co., Inc., is expanding present manufacturing facilities in Gardena, Calif. The addition will provide new general offices, machine assembly area and will also house the Burgmaster Div. Present office space will be used by the Sales and Engineering Depts. In addition to the building, new machines have been purchased as part of a modernization program.

Nylon Bearings — The Bunting Brass & Bronze Co. has added Nylon to its line of cast bronze, sintered metals and aluminum in the field of bearings and special parts. It will be known as Bunting Cadco Nylon, a special formulation of nylon produced by Cadillac Plastic and Chemical Co., Detroit. It will be distributed by Bunting throughout its national and international and industrial distributor system.

New Sales Unit—Stamco, Inc., New Bremen, O., producers of coiling, slitting and shearing equipment, has formed Stamco Sales, Inc. Offices have been opened in Cleveland, Chicago, Detroit and Chatham, N. J.

Through a Merger—Morehouse Machine Co. has formed an Electronics Division at the Morehouse plant, York, Pa. It was formed through a merger with Applied Electronics, a York company manufacturing metal detecting equipment and industrial electronic controls. Morehouse Machine produces proving rings and force measurement instruments.

Concludes Agreement — Stran-Steel Corp., Detroit, Div. of National Steel Corp., has concluded an agreement with Central Bridge Co., Ltd., a subsidiary of The Toronto Iron Works, Ltd., Toronto, Ont. Central Bridge will produce and distribute Stran-Steel buildings and architectural products in Canada.

$2 Million Barriers—In order to stop head-on crashes, The New Jersey Turnpike Authority is spending over $2 million for steel medial barriers. U. S. Steel Corp.'s American Bridge Div. has an order for 62.5 miles of double beam steel guard rail. It will be used to divide opposite lanes of traffic on the turnpike.

To Build and Market — Selectrons, Ltd., New York City, has been organized to build and market selective plating equipment. The company is introducing a new line of power packs, styluses, and electrolytes. They are designed for controlled deposits of many metals and alloys on almost any conductive basis material.

Turbine for Furnace—A gas turbine for blast furnace blowing is now in operation at the U. S. Steel Corp.'s South Works, Chicago. Made by Westinghouse Electric Corp., Lester, Pa., the turbine supplies air required for blast furnace blowing. Blast furnace gas is burned as a fuel for the gas turbine.

"Did you get along well with other people?"

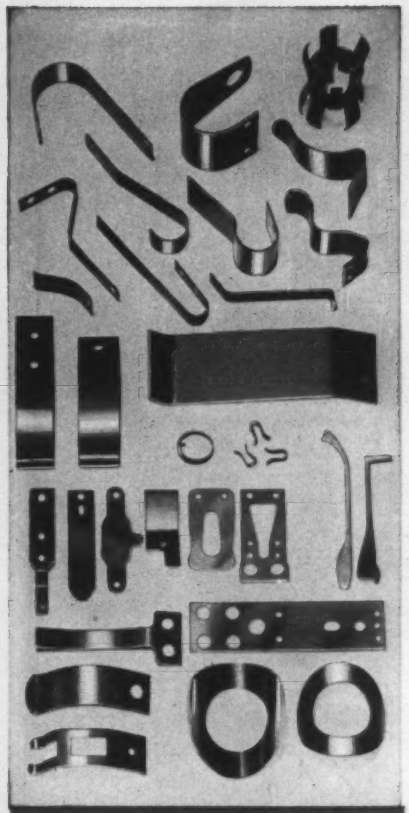
New Refractories — The Kaiser Refractories & Chemicals Div. will build a $500,000 facility at Columbiana, O. It will manufacture special refractories required in the basic oxygen steelmaking process. Raw materials for making special tar-bonded refractories consist of sized deadburn dolomite and periclase. Dolomite from the East will be used and periclase will be furnished by Kaiser Refractories' new Midland, Mich., plant.

All-State Buys—All-State Engineering Co., Inc., Milwaukee, purchased the Industrial Crane & Hoist operation of Borg-Warner Corp., Chicago. The Borg-Warner operation is being moved to Milwaukee where All-State has built an addition to its present plant to handle the expansion. Some of the personnel of Industrial Crane & Hoist has joined the All-State company in Milwaukee.

A New Name — Westinghouse Electric Corp.'s Welding Dept. is now designated as the West-ing-Arc Dept. The new name recognizes that products are engineered, manufactured, and marketed for use in the fields of metals joining, fusing, separation, metals removal, finishing, surfacing or depositing and melting, principled on the electric arc.

To Boost Capacity — Two new industrial gas facilities of Air Products, Inc. will boost its capacity to more than 75 million cu ft per month. One facility, located at Hopewell, Va., is already in operation. Another is scheduled to start operations in November in Newark, N. J.

Exclusive Sales Rights — The Morgan Engineering Co., Alliance, O., and its Pittsburgh subsidiary, Crane & Mill Sales, Inc. have been granted exclusive sales rights on steel mill accounts of material handling equipment produced by American Forge & Mfg. Co., McKees Rocks, Pa. Morgan will feature the American Forge coil tilter at the Assn. of Iron & Steel Engineers Show in Cleveland, Sept. 27-30.



SANDVIK

SPRING STEEL QUALITY

Earns Its Pay By PRECISE PERFORMANCE

Where performance is important, Sandvik spring steel quality is well worth its price. Many spring steel users have found that Sandvik delivers the *exact* performance they want under their tools and in their products.

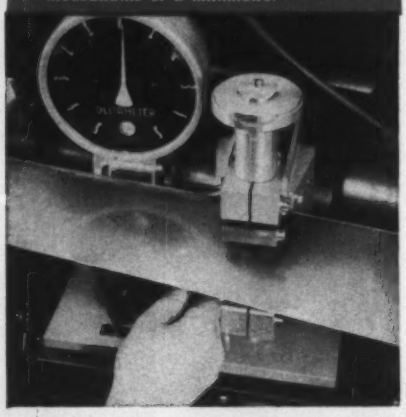
Sandvik's purity, small lot processing and painstaking quality control assures your money's worth in consistent quality performance.

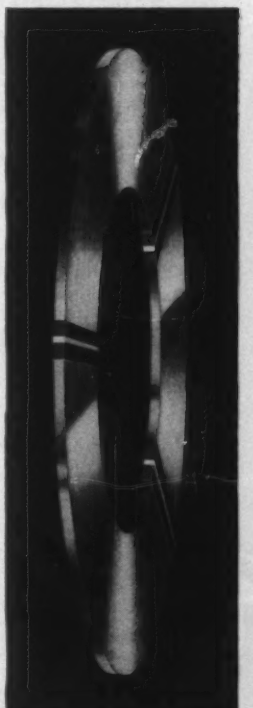
In addition to the wide variety of qualities and sizes carried in stock, Sandvik has local facilities for custom-processing and finishing to your requirements.

For specific physical properties plus accurate flatness, straightness, width, gauge and edge finish, specify a Sandvik spring steel.

Send for free brochure on various Sandvik cold rolled and hardened and tempered strip steels.

Strip thickness is checked during rolling and at final inspection with a "Deltameter", an instrument developed at Sandviken for measuring variations of thousandths of a millimetre.





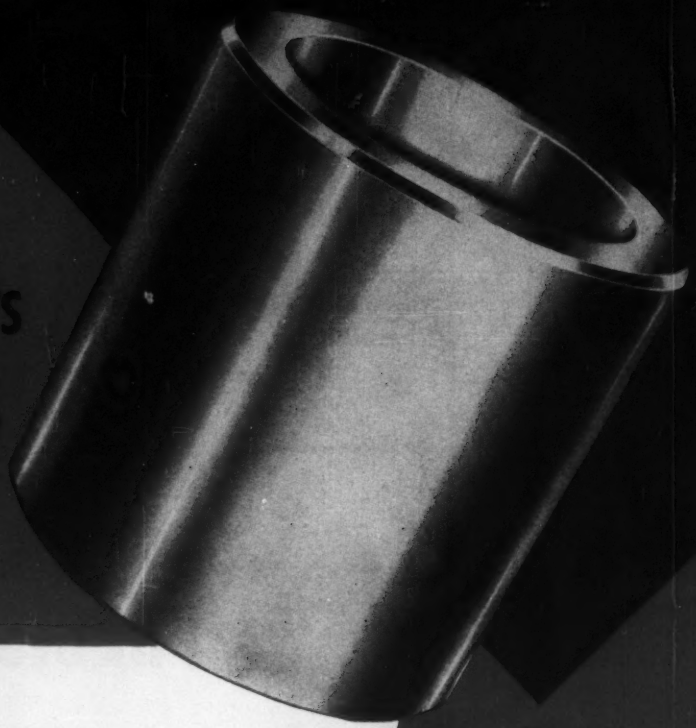
SANDVIK STEEL, INC.

1702 Nevins Road, Fair Lawn, N. J. SWarthmore 7-6200
• N.Y.C. ALgonquin 5-2200

Branch Offices:
Cleveland • Detroit • Chicago • Los Angeles
SANDVIK CANADIAN LTD. P.O. Drawer 1335, Sta. O. Montreal 9, P. Q.
Works: Sandviken, Sweden

SS-200

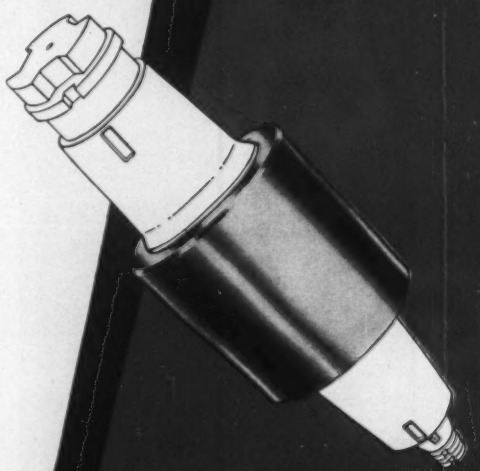
Now Ohio offers FORGED SLEEVES for back-up rolls



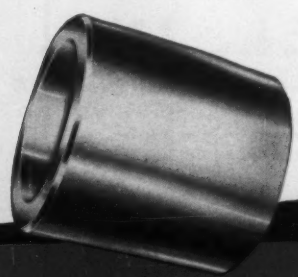
Ohio Steel—specialists in manufacturing all types of iron, steel and forged steel rolls—now offers the rolling mill industry *a superior forged steel sleeve for back-up rolls.*

Ohio back-up roll body sleeves are forged and hardened from *balanced alloy vacuum poured degassed steel.* These sleeves are accurately machined and applied to either new or used forged steel or cast steel arbors.

Yes, Ohio Steel offers a complete back-up roll service. Ask your Ohio roll sales engineer about this modern facility that can help increase rolling mill efficiency.



- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Flintuff Rolls
- Double-Pour Rolls
- Chilled Iron Rolls
- Dense Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Forged Steel Rolls



OS 41

THE OHIO STEEL FOUNDRY CO., LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO... *Virtually at the center of the steel industry*

C. E. Kendall, named president, treasurer and general manager, Connecticut Investment Casting Corp. He succeeds P. J. Dwyer who becomes chairman of the board.

Clark Equipment International, C. A. — **C. W. Massie, Jr.,** appointed vice president, sales.

The Martin Co.—**A. R. Teasdale, Jr.,** named technical consultant.

The Black & Decker Mfg. Co.—**Charles Spoerer,** appointed plant manager, Hampstead, Maryland, plant.

Bliss & Laughlin, Inc.—**Robert Davidson,** appointed asst. Western sales manager.

Stromberg-Carlson Div., General Dynamics Corp.—**R. O. Wright,** appointed district manager, Rome, N. Y., office.

Crucible Steel Co. of America—**C. A. Cardarelli,** appointed asst. manager, St. Louis sales branch.

The Thompson - Ramo - Wooldridge Products Co.—**R. J. Barrett, Jr.,** appointed director, administration.

Westinghouse Electric Corp.—**B. W. Morrison,** appointed area sales manager, Boston district office.

The Youngstown Sheet & Tube Co.—**Dr. H. N. Lander,** named asst. director, research.

Yale & Towne International, Inc.—**C. F. Burgman,** appointed managing director.

The Carpenter Steel Co.—**J. W. Keegan,** appointed metallurgist, hot and cold heading steels; **A. R. Walsh,** promoted to asst. metallurgist, high temperature alloys; **C. A. Divine, Jr.,** promoted to asst. metallurgist, stainless steels.

Samuel G. Keywell Co., Inc.—**J. P. Cochran,** appointed district manager, Pittsburgh office.

Garlock Inc.—**J. A. Henderson,** appointed supervisor, research and development section, Engineering Dept.

J. W. Arnold, appointed president and general manager, Parsons Co., Newton, Ia.

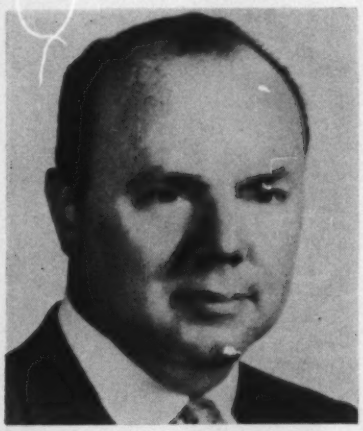
Electro-Alloys Div., American Brake Shoe Co.—**R. K. Cannon,** appointed sales manager.

Westinghouse Air Brake Co.—**C. H. Smith,** appointed special assistant to the president.

Keystone Manufacturing Co.—**J. C. Woodle,** appointed O. E. M. sales manager.

Kaiser Refractories & Chemicals Div., Kaiser Aluminum & Chemical Corp.—**J. R. Bachman,** appointed

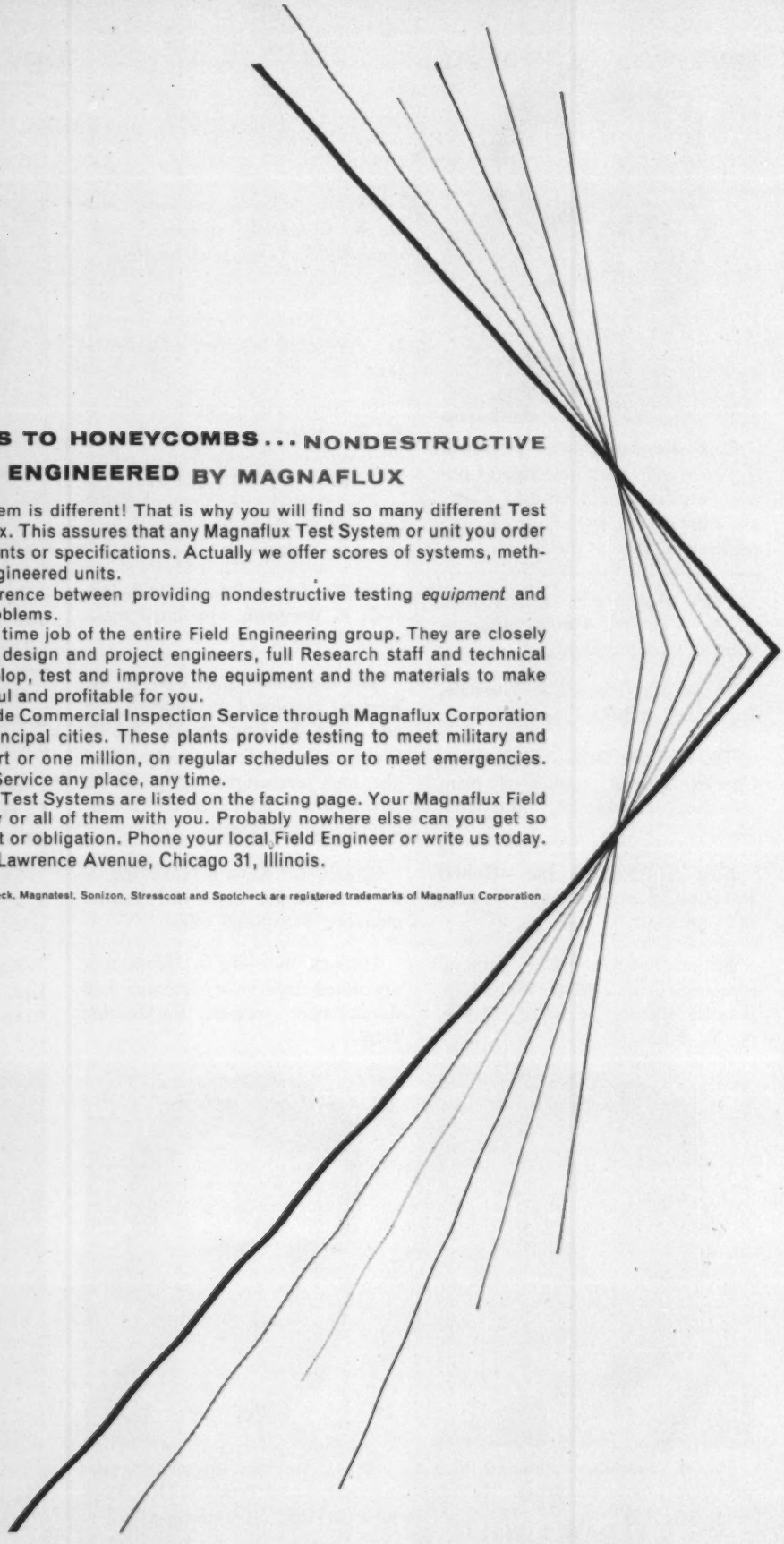
(Continued on P. 74)



A. R. Schaub, appointed vice president, manufacturing, L. J. Wing Mfg. Co.

D. L. DeVries, appointed sales manager, Metal Products Div., Koppers Co., Inc., Baltimore, Md.

W. P. Barrett, named manager, Machinery Sales Dept., Dravo Corp., Pittsburgh.



FROM STEEL BILLETS TO HONEYCOMBS... NONDESTRUCTIVE TEST SYSTEMS—ALL ENGINEERED BY MAGNAFLUX

Of course your testing problem is different! That is why you will find so many different Test Systems engineered by Magnaflux. This assures that any Magnaflux Test System or unit you order will meet your specific requirements or specifications. Actually we offer scores of systems, methods, instruments and custom-engineered units.

Even so, there is a big difference between providing nondestructive testing *equipment* and providing solutions to testing problems.

Providing *solutions* is the full time job of the entire Field Engineering group. They are closely supported by over 80 Magnaflux design and project engineers, full Research staff and technical men whose whole job is to develop, test and improve the equipment and the materials to make nondestructive testing most useful and profitable for you.

In addition we offer nation-wide Commercial Inspection Service through Magnaflux Corporation owned test centers in fifteen principal cities. These plants provide testing to meet military and individual specifications, one part or one million, on regular schedules or to meet emergencies. Also complete Field Inspection Service any place, any time.

A few of the many Magnaflux Test Systems are listed on the facing page. Your Magnaflux Field Engineer is ready to discuss any or all of them with you. Probably nowhere else can you get so much expert counsel without cost or obligation. Phone your local Field Engineer or write us today. Magnaflux Corporation, 7302 W. Lawrence Avenue, Chicago 31, Illinois.

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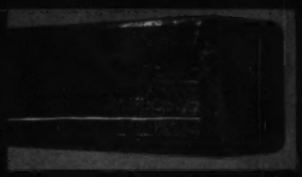
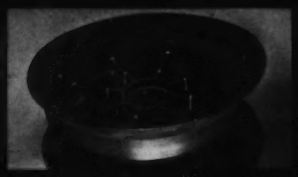


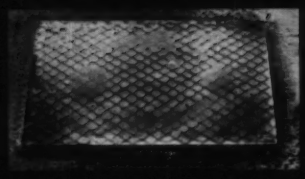
MAGNETIC PARTICLE

Magnaflux and Magnaglo—Most used way to find crack-type defects in any magnetic material or part. Just as fast or automatic as you need.



FLUORESCENT PENETRANT

Zyglo and Zyglo-Pentrex—for nonmagnetic metals, plastics, glass. Finds open-to-the-surface defects other methods will likely miss. As sensitive as you want.



THERMOGRAPHIC

Bondcheck—for honeycomb structures. Uses heat-sensitive fluid, and infrared to find lack of braze or other defects. Fast, cheap, with permanent record.

EDDY CURRENT

Magnatest—Many kinds of instruments to determine metal properties, defects, characteristics electronically. Hundreds of applications—more all the time.

DYE PENETRANT

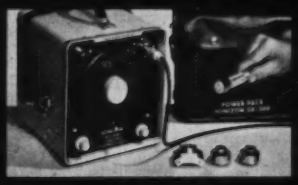
Spotcheck—for portable, fire-safe tests. Convenient kits find surface flaws in metals, plastics or other solid materials. All materials in spray-on cans.

STRESS ANALYSIS

Stresscoat—sprayed-on brittle coating for simple, quick quantitative and qualitative measurement of stress so you can make parts lighter and stronger at lower cost.

MAGNETIC FIELD

Precision measurement—sensitivity of 1 mOe full scale; readings to 1/100th mOe. Accuracy of ± 1% of scale reading. Measure recording tape static, curie point, degauss ships, etc.



ULTRASONIC

Sonizon—to measure thickness direct reading. Reveals corrosion or wear, thickness in walls, laminations, lack of bond. Also, pulse-ultrasonic test service in many cities at MX Test Centers.

GAMMA RAY & X-RAY

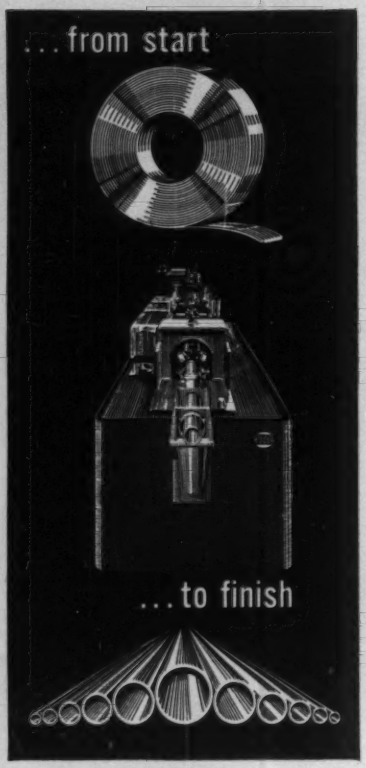
Testing service—available at several locations. This radiographic inspection is performed by certified technicians and engineers at your plant or at your local MX Test Center.

A SUBSIDIARY OF GENERAL MILLS

General Mills

MAGNAFLUX CORPORATION

TEST SYSTEMS



YODER PIPE & TUBE MILLS

A Yoder engineer can help you realize remarkable savings in the manufacture of ferrous or non-ferrous pipe or tube. He can show you how present Yoder Pipe or Tube Mill owners are increasing production, lowering over-all manufacturing costs and reducing downtime through use of Yoder Mills.

If your products require pipe or tubing from 5/16" to 26" diameters, Yoder Pipe or Tube Mills and accessory equipment can help you produce your product more efficiently to meet today's competitive markets.

In addition to Pipe or Tube Mills, Yoder engineers and builds a complete line of Slitting equipment and Cold Roll-Forming Machinery.

For complete information on Yoder Tube Mills...send for the fully illustrated, 64 page Yoder Tube Mill book ...it is yours for the asking.

THE YODER COMPANY
5510 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
PIPE AND TUBE MILLS
(ferrous or non-ferrous)

(Continued from P. 71)

manager, basic refractories laboratory, Milpitas, Calif.; **B. G. Altmann,** named asst. to the director, research and development; **J. R. Martinet,** will head the product application section at Milpitas.

J. W. Rogers, named president, Stamco Sales, Inc., Cleveland.

Stran-Steel Corp.—**J. E. Parsons,** named asst. to the president.

Valley Iron Works—**E. J. Kreger,** promoted to general superintendent, foundry, pattern shop.

Van Straaten Chemical Co.—**D. J. Deakyne,** named asst. general sales manager.

Garlock Inc.—**J. G. Woppman,** appointed plant manager, Palmyra, New York, facilities.

D. J. Sauser, named engineering manager, technical sales and service, Cherry Rivet Div., Townsend Co., Santa Ana, Calif.

J. B. Beckwith, appointed manager, manufacturing engineering, Associated Spring Corp., Bristol, Conn.

Canco Div., American Can Co. — **Alexander Black,** appointed manager, Marketing Div.

National Research Corp.—**A. F. Cullen,** appointed director, personnel.

Dana Corp. — **W. E. Vogel,** named chief engineer, manufacturing research and development.

A. W. Harrington, named manager, distribution, Alloy Tube Div., The Carpenter Steel Co., Union, N. J.

Allis-Chalmers Mfg. Co. — **William Haight,** appointed superintendent, scheduling and material control, foundries and pattern shops, West Allis Works; **J. C. Warner,** appointed asst. to the director, manufacturing, Allis-Chal-

(Continued on P. 78)

YOUR ONE, COMPLETE SOURCE FOR HIGH TEMPERATURE HIGH STRENGTH METALS IN ALL FORMS

Complete Production Facilities

All the tools to do the job are here—all types of vacuum melting and electric arc furnaces, complete rolling and forging equipment. You can get the highest quality mill products—billets, bar, wire, sheet, strip and plate to *your exact specifications.*

Extensive Research and Development

Universal-Cyclops modern research facilities include pilot plant operations and the most modern testing equipment. From Universal-Cyclops has come such well known alloys as Unitemp 19-9 DL, Unitemp N155, Unimach I, and Unimach UCX2. Present alloy development programs will lead to other useful metals.

Geared for Fast Service

Call your nearest Universal-Cyclops District Sales Office for dependable service on Unitemp high temperature metals and Unimach high strength steels.

Melting Furnaces Illustrated

① Electric Arc, Precision Air Melting

② Inductovac®, Induction Vacuum Melting

③ Duomelt®, Consumable Electrode Vacuum Melting

—And Duovac® (not illustrated)—combining processes 2 and 3.

UNIVERSAL CYCLOPS

UC STEEL

STEEL CORPORATION

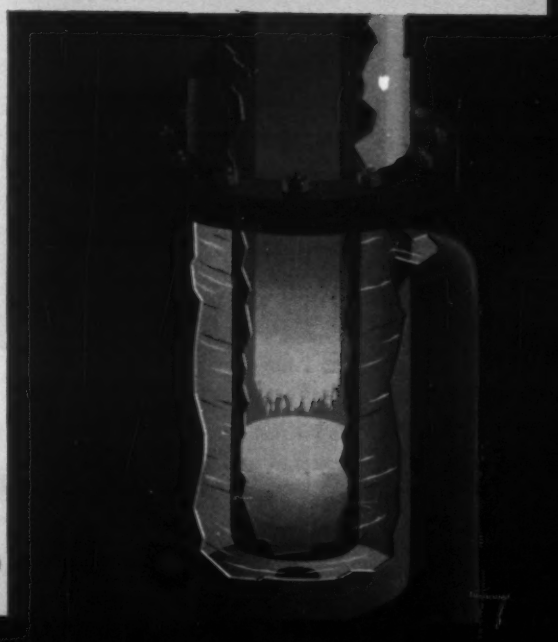
EXECUTIVE OFFICES: BRIDGEVILLE, PA.

HIGH TEMPERATURE METALS • STAINLESS STEELS

TOOL STEELS • REFRACTORY AND REACTIVE METALS

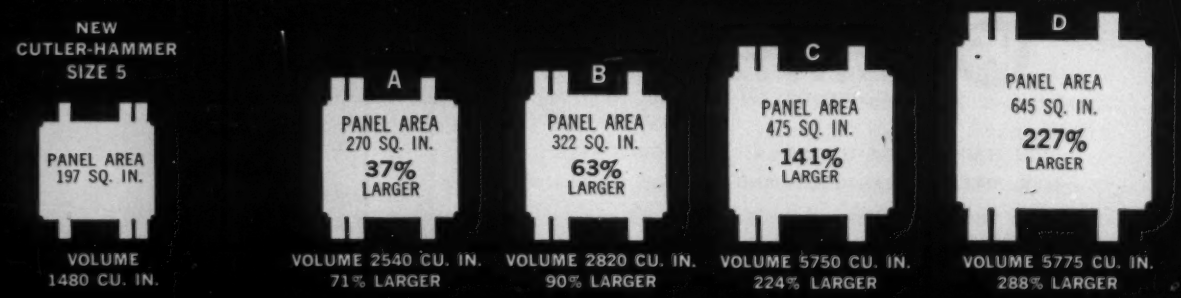
①

②



③

THE NEW CUTLER-HAMMER SIZE 5 STARTER IS FAR MORE COMPACT THAN OTHERS



Now! A complete line of easy-to-install Cutler-Hammer Starters including a new compact Size 5

7 sizes for use as components or as complete starters

(Size OO, O, 1, 2, 3, 4 and 5)

Now get all the advantages of Cutler-Hammer's Three Star starter line in seven sizes. You can control motors from fractional hp up to 200 hp, now that the new Size 5 is available.

The new Size 5 starter needs only an eight-inch deep case. Its open dimensions are only 13″ wide, 15 3/16″ high, 7½″ deep . . . and is available as a non-reversing or reversing starter or as a contactor.

Even the wiring's easier. Instead of struggling to force the line and load cables into the lug connectors, the lugs unbolt, and are easily reassembled.

You still get, of course, the famous Three Star advantages that have made Cutler-Hammer Starters so famous: dependable pivoted armature, vertical contacts that don't collect dust, ease of installation, ease of inspection and maintenance, plus many other features.

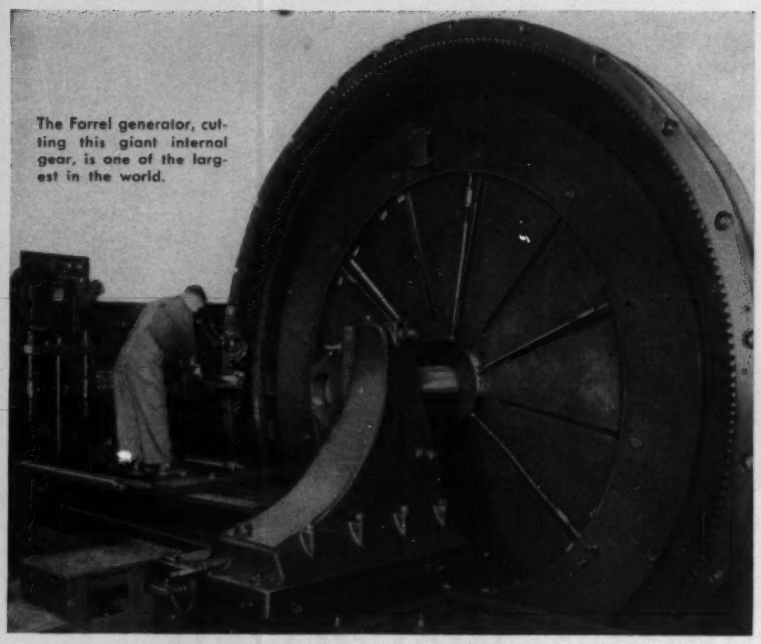
Be sure to send for Pub. LO-69-Q246 to get all the facts on the complete Cutler-Hammer Starter line.

What's New at Cutler-Hammer? There's a new spirit here. You can see it in the new products, the new engineering talent, the increased plant capacities. We're ready for the great growth of the sixties so you can be ready to meet the great demands upon your capacities. We'd like to tell you more. Contact the Cutler-Hammer electrical distributor or the Cutler-Hammer sales office nearest you.

WHAT'S NEW? ASK...

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.



The Farrel generator, cutting this giant internal gear, is one of the largest in the world.

GIANT GEARS
for giant jobs

When designs call for huge gears, specify Farrel. The company has the experience and the gear-cutting and machining facilities to produce the largest gears required.

Farrel single-helical or spur gears are produced with generated teeth in sizes up to 23 feet diameter, 30 inches face. By alternate cutting methods this diameter limit can be greatly exceeded.

Continuous-tooth herringbone gears are made in sizes up to 23 feet diameter, 60 inches face; internal gears, with single-helical or spur teeth, up to 23 feet external-blank diameter, 20 inches face.

Call Farrel on your next large gear requirement. Farrel engineers will analyze your problem and recommend gears suitable to your requirements.

FARREL-BIRMINGHAM COMPANY, INC.
BUFFALO, N.Y., Telephone: Bedford 3440

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Akron, Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Atlanta
European Office: Piazza della Republica 32, Milano, Italy

This huge, 7-degree, single-helical gear will be used in a cement kiln.

FARREL ®

AGMA

FB-1198

(Continued from P. 74)

mers International; **W. C. Gardner,** named territory manager, engineering products, middle and east Asia and Oceania.

Vickers Inc., Div. of Sperry Rand Corp.—**D. R. Harter,** District manager, Houston, Texas, office.

H. A. Hauser, named Eastern regional sales manager, Alloy Tube Div., The Carpenter Steel Co.

Kilsby-Tubesupply—**Julian Fotre, Jr.,** appointed manager, Northern California operations.

David Neill, appointed manager, roll grinder sales, Farrel-Birmingham Co., Inc., Ansonia, Conn.

Fuller Co., Lehigh Fan and Blower Div.—**W. A. Crowder,** appointed representative, sales engineering and customer service.

Atkins Saw Div., Borg-Warner

(Continued on P. 80)

PALLETIZING CUTS PACKING COSTS 65%

It all started when a customer requested palletized shipments of baseboard heating units to lower handling costs. Tranter Manufacturing Co., Inc. installed an Acme Steel F1 Strapping Machine to fasten pairs of panels and a 114 Steelstrapper to secure the pallet loads. As a result, they cut *their* packaging costs 65%.

By strapping units, "hidden damage" in transit is also eliminated. Handlers now take greater care since damage to exposed panels can be detected on the spot.

Perhaps substantial savings are in store for your packaging operation. Call your Acme Idea Man or return the coupon for further facts.

ACME STEEL

IDEA LEADER IN

STRAPPING

Acme Idea Man Marty Meehan suggested Idea No. S2-32 to Tranter Manufacturing Company, Inc., Lansing, Michigan.

ACME STEEL COMPANY
Acme Steel Products Division
Dept. IFS-80
135th St. & Perry Ave.
Chicago 27, Ill.

Please send me Idea No. S2-32 and examples of how major companies in my field use Acme Steel Strapping.

*Name*_____

*Title*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

General Fireproofing depends on...

FEDERAL-WARCO

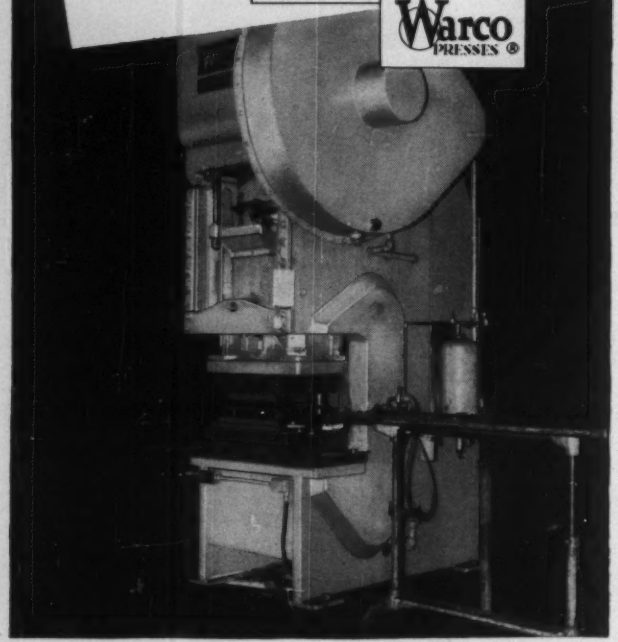
Warco presses and Federal welders operate as an integral part of General Fireproofing Company's production lines. They help General Fireproofing maintain its high quality standards and close tolerances, while meeting rigid production schedules.

The Warco press illustrated below, with related Federal-Warco equipment, helps General Fireproofing produce distinctive metal desks, filing cabinets, aluminum chairs, partitions and other products for the modern office.

THE FEDERAL MACHINE AND WELDER COMPANY
Warren, Ohio

Federal® WELDERS

Warco® PRESSES



(Continued from P. 78)

Corp.—**E. M. Nolander,** named industrial products representative.

W. K. Jones, Jr., appointed export manager, sales, Russell, Burdsall & Ward Bolt & Nut Co.

J. A. Schaefer, named Western territory representative, castings, rolls and machinery, The Youngstown Foundry & Machine Co.

New York & New Jersey Lubricant Co.—**R. N. Ecsedy,** named sales representative, Connecticut and Southeastern New York State.

Climax Molybdenum Co.—**J. T. McCabe,** appointed lubricant development engineer.

Grove Valve & Regulator Co.—**C. W. Brown,** named sales and technical service representative, Oklahoma and Kansas.

Stromberg - Carlson's Telecommunication Div.—**G. G. Orman,** appointed manager, industrial sales.

Roebling Hose Reinforcing Wire... The best things come in no-charge packages

When you buy Roebling Hose Reinforcing Wire it is delivered to you on no-charge spools that mean savings to you.

This modern method of packaging does away completely with deposits and the bookkeeping involved; it contributes, too, to lower freight costs and saves storage space. Thus, you avail yourself of a precision-made and quality controlled product, without any handling, shipping and inventory inconveniences.

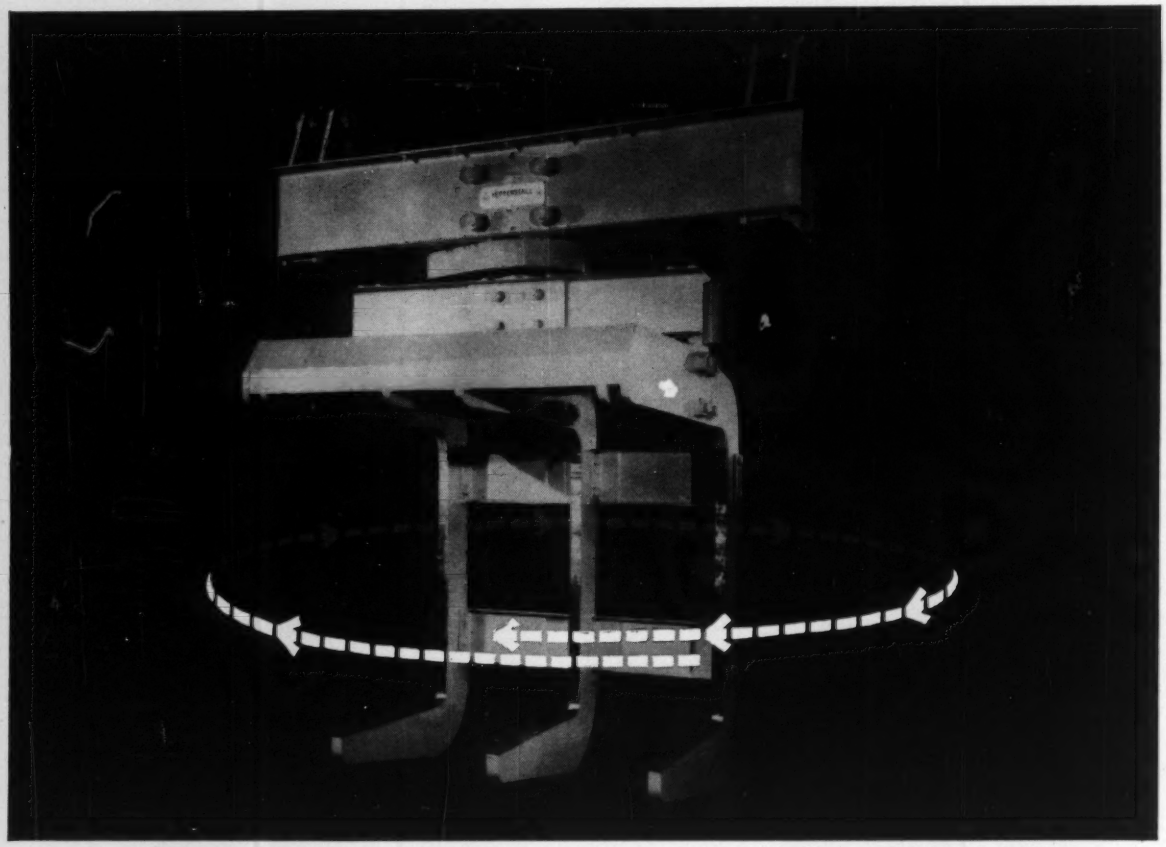
Roebling Hose Reinforcing Wire, used for braiding reinforcement, is produced in a complete range of sizes. Write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey, for details.

Roebling . . . Your Product is better for it

ROEBLING

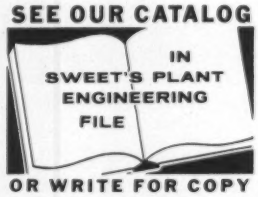
Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

NEW Heppenstall motorized slab lifters have continuous 360° rotation



Slabs may be rotated in either direction quickly and easily by this Heppenstall Slab Lifter.

With this lifter, up to 30 tons of steel slabs can be lifted and automatically rotated without limit in either direction. Spreader bars position the three high-tensile alloy steel C hooks on 32-inch centers. The rotating mechanism is contained within a double beam which has two bails on 8-foot centers for double crane hoist mounting. For maximum stability, the load is suspended from the rotator by a rigid, bearing-mounted shaft. The C hooks are counter-balanced to remain level at all times. For more information or a quotation, contact your Heppenstall Company Representative or Heppenstall Company, Materials Handling Division, New Brighton, Pennsylvania.



HEPPENSTALL COMPANY
PITTSBURGH 1, PENNSYLVANIA
Plants: Pittsburgh, Pa. • Bridgeport, Conn. • New Brighton, Pa.

MIDVALE–HEPPENSTALL COMPANY
NICETOWN, PHILADELPHIA 40, PA.

Die Blocks • Forgings • Back-Up Roll Sleeves • Rings • Industrial Knives • Materials Handling Equipment
Pressure Vessels • Hardened and Ground Steel Rolls • Vacuum and Consumable Electrode Melted Steels

Special Fasteners

■ Never steer clear of a product on the basis of its initial cost alone. Several other factors are every bit as important to the overall cost picture. Such is often the case with special fasteners. The invoice that follows each shipment proves that the special fastener is an expensive item. But what about the assembled cost? Certainly, that is just as important as the price "as sold."

The custom-engineered "special" costs more than the conventional fastener, but its assembled cost is low. Investigate the "in place" cost. Then see if there's a cost advantage.

With a sharp eye on production costs, many companies redesign the product they're making to edge ahead of competition. They then go to the manufacturer of special fasteners. "Design the fasteners that will hold this new subassembly together. The fasteners must be strong, durable and inexpensive to assemble."

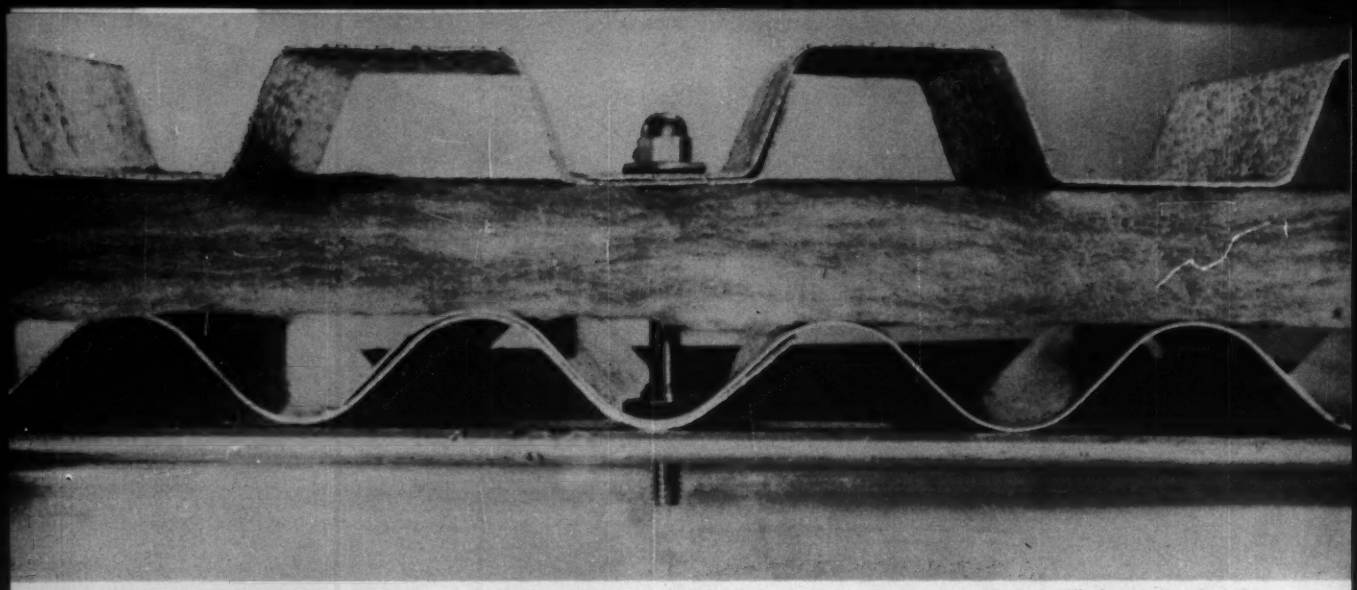
Thousands of stock specials, many of them threaded, also play a vital role in industry. Their functions vary from higher fastening strength and locking action to control of vibration and sealing quality. Whether your company is big or small, look into the matter. It's to your benefit.

How to Get More For Your Metalworking Dollar

No. 4 of a Series

Special fasteners is the subject for this feature, the fourth in The Iron Age's 1960 Metalworking Dollar Series. Other features include:

1. March 3: Cutting Fluids
2. April 14: Numerical Controls
3. June 30: Metallic Coatings
4. October: High-Strength Metals
5. December: Special Machining Methods



Allegheny Ludlum Steel Corp.

ONE-PIECE FASTENER: Self-tapping screw, made of stainless, replaces three conventional fasteners. It holds exterior sheet, insulation and interior sheet to framing member of curtain wall panels.

■ How to Get More for Your Special Fasteners Dollar | **Section 1**

Specials Reduce Assembly Cost

If you turn out items in heavy quantity or if you build a quality product, then you're a prospect for specials.

Bear in mind that it's the assembled cost that counts.

By **R. R. Irving**

■ Every company engaged in metalworking can probably find several spots where special fasteners will serve to good use. To the mass producer, such savings might take the form of thousands of dollars in the production line. To the small manufacturer, it might be some device to improve the quality of its end product.

A special fastener does more than just fasten. More of these fasteners are being used every day in the space age. Safe flight is the key to progress of every missile and aircraft. New designs in this area of special fasteners offer greater strength and safety to vital subassemblies.

Design Changes—The compact car is placing heavy demands on new types of fasteners. Smaller parts require that a brand new army of fasteners come off the drawing board. New patents are being issued at a growing rate.

The worlds of appliances, electronics and even toys depend on special fasteners to get the job done quickly and economically.

Companies in all of these fields hold high ranks in size and production performance. Their targets are identical in one respect: Optimum production efficiency. For this reason alone, these companies have a high regard for special fasteners. They are not just gimmicks. In truth, they are vital cogs both in planning and production.

In the Black—The best way to see the value of "specials" is to understand what they can do. There's nothing cheap about them. Why is this so? To make them, countless hours go into design. Special tooling also affects their higher price.

Never judge special fasteners by the purchase price alone. That's only part of the picture. Look at them from a more mature viewpoint. How much do they cost to assemble? Once you start thinking in such terms you're ready to study the subject.

At times, your inventory can be reduced at good savings. You might be able to replace that eight-piece fastening assembly with a four-piece special. Very often, such a change can be made without sacrificing one ounce of quality. It might even be improved.

First Place—The special fastener is an indispensable aid to the mass producer. It provides a means by which he can gain an edge on his competition. It enables him to reduce his assembly costs and to create new designs. The end product also becomes more reliable.

How Industry Puts Specials to Work

END PRODUCT	TYPE OF FASTENER	FASTENING JOB	ADVANTAGE
Vacuum cleaner	Threaded insert	Components to end plates	Automatic installation
Clutch	Slotted pin	Linkage	Also functions as a pivot
Shotgun	Oval head screw fitted with nylon pellet	Trigger guard to receiver	Withstands severe shock
Mobile fan	One-piece multi-nut fastener	Trunnions to housing	Replaces several stampings plus other fasteners
Metal rotisserie	Expansion rivets	Housing sections	Quick installation, smooth appearance
Truck bodies	Blind rivets	Exterior panels to body frame	Installed from one side with ordinary hammer
Building construction	Two-piece sealing screw with colored head	Architectural curtain walls	Exact color match, resists corrosion
Aluminum windows	Metal stitches	Corners of frames	Fast assembly, reduced material costs
Aircraft engine	Hold-down studs	Radial crank-case	No loosening after 500 hours of service
Railroad flat cars	Rivet-bolt combination	Oak decking to cast steel frame	Fast installation

Many specials have already started to enjoy universal use. Even though they were initially designed for a specific job, the same fastener has made itself felt in other areas where the same functions are required. Even specifications have been devised to cover them.

Safe Joints—Do you have vibration problems? If so, proper controls can be exerted by specials. Do you worry that the fastener might come loose, thereby spoiling a costly assembly? There are fasteners of every description designed to prevent such accidents. Secret of their safety is a positive locking action.

Is your product so sensitive that harmful gases, liquids or just plain air are fatal? Once again, there are many types of fasteners that also function as permanent sealants.

Is your product reassembled from time to time? How re-usable are your present fasteners? Many specials on today's market can be reused over and over without losing their original traits.

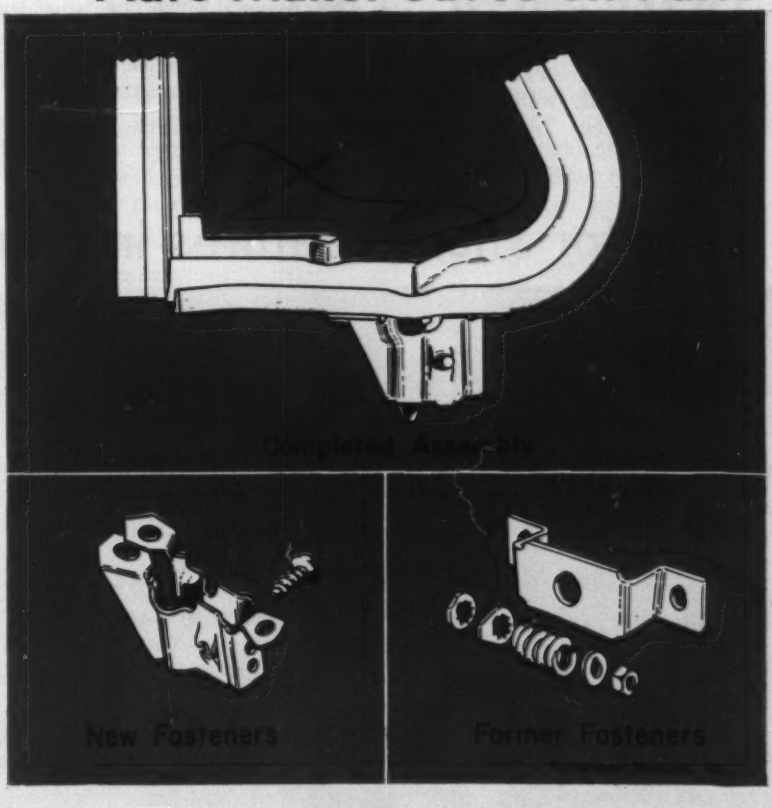
Homespun Engineering—It happens in every shop. A tough job comes along. The foreman resorts to "Rube Goldberg" methods for an answer. The problems vary. It might be an over-sized hole. How do you go about spanning it? Sometimes, it's a case of installing the fastener in a spot where access is limited.

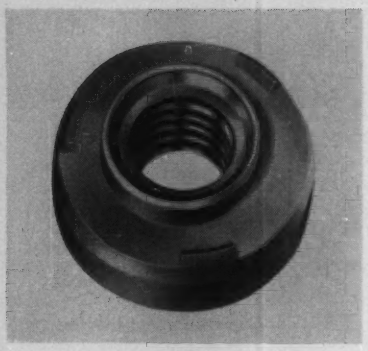
How about the joining problem where the joint must be made from one side only? In all of these cases, there are plenty of fasteners to do the trick.

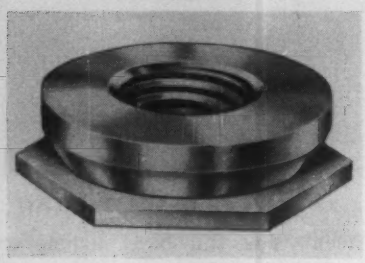
Of course, you could be thinking of some very special type of fastener that no manufacturer makes. What then? You still have nothing to worry about. It takes a tailor-made attitude on the part of the fastener maker to transform your idea into a functional part.

Perfect Match—Industry's growing interest in product design cer-

Auto Maker Saves on Parts







Penn Engrg. & Mfg. Corp.

SHEET METAL AIDS: If you can't tap, the weld nut (above) provides a threaded anchor. Insert (below) mounts flush to surfaces.

---

tainly involves the special fastener. Exterior appearance requires fasteners that will fit flush with the surface of the product. Other examples are fasteners of matching colors or peculiar shapes that will conform aesthetically with intricately-wrought surfaces.

Custom-made fasteners find wide use in the appliance and electronics industries. Take the company that used to fasten its ceiling light fixtures conventionally. A single special made a difference in assembly time savings of 80 pct.

Simple Clip — Then there's the case of the company that produced automatic coffee makers. In this setup a special clip was custom designed that replaced three parts—a blade, a bushing and a lock nut. This change resulted in three savings: Faster assembly, easier assembly and lower production costs.

Fasteners like these should be earmarked for the mass producer. The small shop doesn't have the volume of turnover to justify purchases in big lots. How about the little man? Is he a prospect at all? Yes, he is. Of course, it depends on the nature of his product. But if safety and reliability are goals, then there are types for him, too.

Suppose you're going to fasten materials together that are highly machinable. In time, the threads within the materials will tend to deteriorate. Think in terms of another material, a "portable, threaded insert." Such a device will make your joint stronger and longer lasting.

Cardinal Rule—Time study engineers in one mass-production plant noted a major hitch in the fastener assembly line. At this particular point, washers were being set in place by hand. Unfortunately, human hands weren't too accurate. As a result, the washers sometimes dropped on the floor.

Costly delays followed. The workers retrieved the fumbled washers, then assembled them according to procedure. Production supervisors instructed all workers to let those washers stay on the floor. In such lines, the fewer fasteners involved, the less chance for costly delays.

Assembled Cost — Manufacturers will tell you that 80 pct of your fastener cost is in assembly—not in purchase. Therefore, the fastener that can be assembled quickly (without any loss in reliability) should be the choice in many applications.

A large segment of management still chuckles at the mere mention of something so small as a fastener. You'll hear them say: "Little gimmicks like that are just a drop in the bucket to my production costs."

Believe it or not, fasteners are very important to your cost picture. The reason is a very simple one. It costs money to put them together. They deserve the utmost respect of every thinking man in management.

Look for These Features in Fastener Design

Rapid assembly	Fatigue strength	Maintains torque
Re-usable	One-shot application	Eliminates squeaks
Positive locking action	Adaptable to tools	Reduces labor
Vibration control	Fewer production steps	Overcomes misalignment
Light weight	Resists galling	Elastic memory
Fewer parts	Self-threading	Quick release
Sealant	Prevents slippage	Miniaturization
Shear load transfer	Deadens noise	Multiple functions
Flush mounting	Tensile strength	Close tolerances
Blind areas	Design appearance	Surface finish

Tinnerman Products, Inc.

TAKE YOUR PICK: Manufacturers carry fasteners in stock to satisfy the diverse needs of many industries.

■ How to Get More for Your Special Fasteners Dollar | **Section 2**

Market Offers Big Selection

How many types are available? The selection literally runs into the millions.

If you can't find it within that range, there are manufacturers to make it for you.

■ The threaded fastener usually gets superior performance through nut design. It's for this reason that many of the special fasteners on the market today are nuts. At first, the number from which to choose seems staggering. However, there are really not too many basic types.

Most special nuts fall into one of four main groups. These include spring seating nuts, spring stop nuts, interference stop nuts and wedge nuts. Almost every nut that falls into these basic headings is proprietary. The custom-made fasteners, nine times out of ten, are either slight or drastic modifications of such designs.

Spring seating nuts, on the whole, are free spinning and re-usable. Since generic terms are lacking in this entire field, you have to call them by their proprietary names.

Spring Steel—The Speed Nut is a one-piece fastener usually stamped from heat-treated spring steel. Two arched prongs extend upward from an arched base. The arched prongs engage the threads and are so designed to compensate for any variation in thread tolerance.

As soon as this fastener is tightened, both the prongs and the base spring upward, thereby creating a double locking action. Individual nuts are inexpensive, easy to apply, and they can be applied quickly. This nut eliminates the washer, a trait inherent in most special nuts.

Double locking action is also a feature of the Palnut. This fastener can be applied quickly with the fingers, then wrenched into final position with just a quarter to half turn. Like the Speed Nut, the Palnut is very light. It's so light, in fact, that it is about 65 pct lighter than a conventional nut.

Also made from spring steel, it can be used to lock conventional nuts on heavy setups. Generally, both of these nuts can be made from many materials to suit the demands of certain applications.

Time Tested—Another old timer in the special fastener field is the M-F No. 2. This nut differs from the two preceding nuts not only in appearance but in end uses as well. Its design provides an upper and lower section. The top part is grooved. The bottom surface, on the other hand, is arched.

When this nut is tightened, the arched portion flattens. At the same time, the grooved section goes through a pinching action, thereby

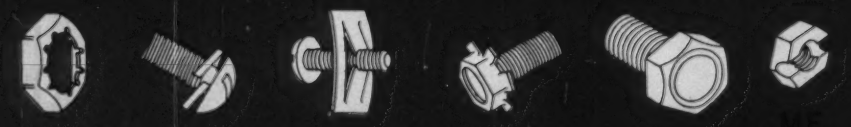
Continued on Page 89

HERE ARE A FEW OF THE MANY STOCK SPECIALS

Wedge Nuts

Klincher Drake Anco Columbia

Spring Seating Nuts And Bolts



Palnut Sems Speed Nut Lock-Tite Place-Bolt MF No. 2

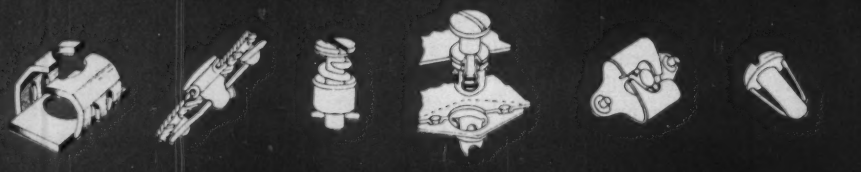
Lock-Shock Dynamic Springlock 350 Springnut An-Cor-Lox

Spring Stop Nuts

Stover Lock Nut Flexloc Marsden Duolock Gripco

Huglock Boots Spring Lock Nut Self-Retaining MF No. 3

Quick Release Fasteners



Snap-Nut Dzus Camloc Quicklock Airloc Springlock

Continued from Page 87

locking the male threads in place. This nut is used on heavier jobs than the other two.

Another free-spinning lock nut is the An-Cor-Lox. This re-usable nut bases its design on a locked-in insert which is crushed when tightened. It not only locks in place but it also seals out contaminants. The nut helps out in poor thread fits, too, by compensating for misalignment.

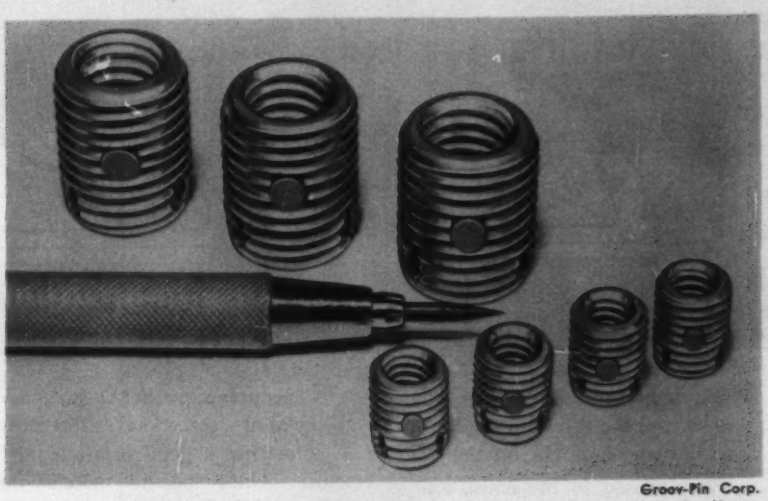
Stop Nuts—A great number of nuts can be found in the class of spring stop nuts. Most of these types have prevailing torque and they are re-usable. The Lamson lock nut, for instance, contains two designs in one piece. The bottom of the nut is conventional. However, the top is made up of an out-of-round collar.

The Lamson nut spins freely until the bolt threads engage the collar. At this point, the bolt forces the collar back into round shape. As a result, you get a radial locking action. Similar action also takes place in the Stover lock nut. There is no collar here. Instead, both designs are incorporated in an ordinary nut body.

The free-spinning Marsden nut has a slotted top and conventional bottom. Once the Marsden nut is seated, pressure from the lower portion forces the upper section to place a radial grip on the bolt threads. This nut is re-usable and can be substituted for conventional nuts.

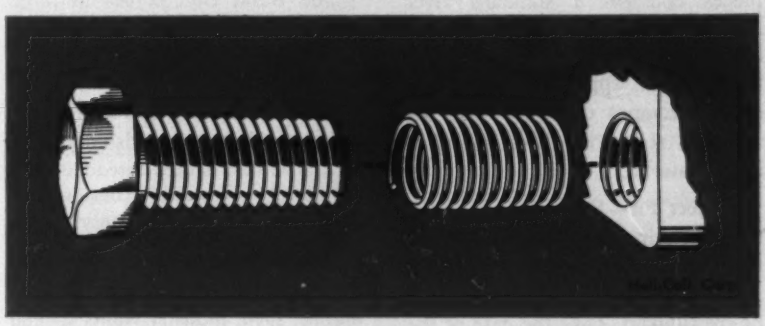
Won't Rotate—Different in design, the Security lock nut contains a projection that fits snugly between the nut body and the insert. Its purpose is to keep the fastener from rotating. Here the insert does the locking, while the nut body carries the load.

The Huglock is a prevailing-torque lock nut with a tapered upper surface. This same section is also slotted. The nut is re-usable and free spinning. As such, you get a frictional lock between the load-carrying flanks of the nut itself and the bolt threads.



Groov-Pin Corp.

SHOCK PROBLEMS?: One answer to the problems of shock and vibration is the steel insert that includes a nylon pellet right in its threads.



VIBRATION-PROOF: Inserts made from coils of wire resist high loads. When locked in position, the insert withstands severe vibrations.

Many other fasteners are included in this group. It's quite obvious that there are a hundred-and-one ways to provide locking action in one-piece metal nuts.

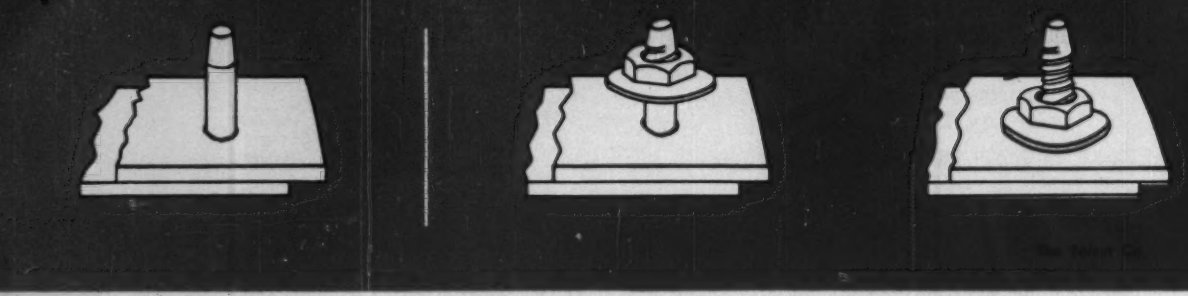
Second Material—The interference stop nuts lean toward a material other than metal to provide locking action. Two good examples of this group are Nylok and Esna fasteners. Both are different in design. However, each fastener is a one-piece prevailing-torque nut.

The Nylok nut comes with a pellet of nylon embedded in the threads. Then, when final locking occurs, the nylon resumes its original shape, picking up greater strength as time goes on. It is re-usable and maintains excellent sealing qualities.

The Esna or Elastic Stop Nut features a red, elastic collar. The collar compresses the bolt threads and distributes the load evenly. This fastener is also re-usable. It performs a fine sealing job, too.

Heavy Work—The work horses in the heavy assemblies are the wedge-type nuts. It's common to find two-piece fasteners in this group. A good example is the Drake nut. While the upper section fastens, the lower part locks. This nut is re-usable and can serve as a stop nut if so desired.

The Columbia lock nut is another two-piece free-spinning type. The Anco, on the other hand, contains a locking pin which serves as a kind of ratchet against the bolt. This one is also re-usable. The free-spinning Klincher contains a grooved washer at the bottom.



When tightened, the washer compresses and the threaded section inside the washer locks on the bolt.

Widely used in the construction industry, the Dardelet fastener is part rivet, part bolt. One of its two pieces contains a standard rivet head, a ribbed shank and a threaded end. The other piece is a mating nut. When applied, the ribbed shank becomes deformed and develops a solid "hold" on the fastened material.

Perfect Fit—Even though industry is convinced that the nut is responsible for greater fatigue strength, the bolt itself should never be overlooked. Take the case of the Lok-Thred principle. This unusual fastener only requires a tapped hole. As the bolt threads its way into the hole, the threads don't quite mate.

The end result is a fit that is just about as close to perfect as possible. It provides superior strength along with a useful sealing quality.

In the Place-Bolt, the design is in the head. This feature permits a great amount of elastic deformation. The forged head contains six slots on the top. Right under the head is a depressed circle. These two features work together to provide a spring action. Vibration and fatigue failures are thus reduced.

Two in One—A screw and lock washer turn up as one unit in the Sems fastener. The locking teeth of the fitted washer are longer than you'll find in a separate washer. Here, you get two fasteners in one. There is no danger of losing the washer itself.

A neoprene washer just under the head of a screw makes the Tuff-Tite fastener a good insulator and sealer. Once again, there's no chance of losing the washer since the fastener is pre-assembled.

The Blind Bolt comes in three pieces. The first piece is a flanged sleeve, the second an expander nut and the third a core bolt. As the nut is shot into the positioned sleeve, the latter expands enough to lock. The bolt is then threaded onto the nut. This fastener is designed to take care of "one-side-only" jobs.

Special Rivets—Of course, riveting plays a vital role in metal joining. As such, industry wants special rivets for special jobs. Included are three basic types: blind, tubular and drive.

Tubular rivets find use in thin sections where they offer larger bearing areas. They are spun or squeezed into position, not hammered. As a result, the sheet is seldom damaged.

Blind rivets take care of joints where "one-side-only" applications are possible. They provide much more than that, however. Better strength, for instance, is a part of their makeup.

Hammer Driven — Drive rivets are really off-shoots of the blind rivet. The main difference is in the fact that no special setups are required to propel the rivet. They can be driven into place with an ordinary hammer.

Two examples of tubular types are the Huckbolt and the Hi-Shear rivet. The Huckbolt consists of a pin plus a collar. A gun pulls the pin through a prepared hole. The collar is then fitted around the shank end. The collar fastens permanently to the pin and the excess of pin material is broken off.

The Hi-Shear rivet also has two pieces: a pin and a collar. The pin is made of hard material, while the collar is much softer. The collar locks into the pin groove. Excess collar material is then trimmed.

Blind Jobs — There are many blind rivets on the market. The Chobert rivet is inserted into a tapered hole by a mandrel. As the mandrel leaves the hole, the rivet expands and forms a tight fit. The tubular section of the rivet can be plugged if needed.

The Cherry blind rivet is preassembled in two parts. One is a hollow section, while the other part is a stem. The stem has an upsetting head. When the stem is pulled back, the head expands the rivet tail into a tulip head. As the stem is removed, it breaks off and leaves the rivet in place.

Except for one vital feature, the Du Pont rivet resembles a standard solid rivet. How does it differ? A chemical charge runs the length of the shank. When heated, it explodes, thereby lodging the rivet in place.

Two Mandrels—The Pop rivet functions much like the Chobert fastener. Here, you have a choice between two mandrels. One breaks off well below the head, while the other fractures just under the head.

The Southco drive rivet and the Star Pin Grip are examples of drive rivets. Both are driven in with a hammer. As soon as this is done,

the lower part of the rivet body expands (the former type in two directions and the latter in four).

The occasion often arises when you want to fasten a panel for a short period of time, then remove it quickly. This calls for a strong fastener that can be released in an instant. The market offers many types of so called "quick-release" fasteners to handle such problems.

These fasteners are usually released by a quarter turn. In general, they come in three pieces: a stud assembly, a spring pin and some sort of receptacle. The Spring-Lock fastener, on the other hand, is a one-piece device for lighter fastening jobs.

Inserts, Too—In the event that tapped holes are not strong enough, a variety of inserts is available. The inserts often preclude the use of a nut. The Heli-Coil insert is an oversized coil of precision wire that fits snugly inside a tapped hole. It can provide added load strength.

To fasten honeycomb structures, the Shur-Lok insert often comes in handy. This insert has internal threads only. Once it has been molded to the structure, regular bolting techniques can be employed.

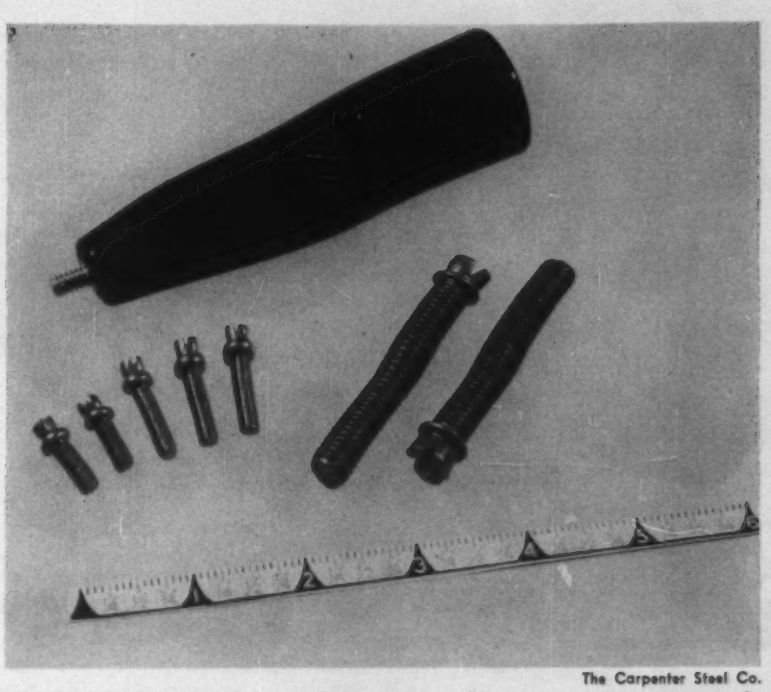
Fastening Help—In the area of washers, there is the Shakeproof lock washer. This fastener comes in a variety of designs, but each one makes use of deep biting teeth. The teeth can be stamped on the inside, outside or both sides of the round washer.

Still another is the Dyna-Seal washer. This device acts as a sealant. It consists of a steel washer plus an inner ring of synthetic rubber. The two features are so bonded to make up a one-piece fastener.

Three of the many types of pins are the Rollpin, the Spirol and the Threaded Taper pins. The Rollpin is made slightly over-sized. When inserted in a hole, it springs back with enough force to hold it in place.

Metal Layers—The Spirol pin has several layers of thickness, giving it high resistance to shock and shear strength. The Threaded Taper pin, thanks to its threaded end, is useful in blind fastening. It can also be easily removed.

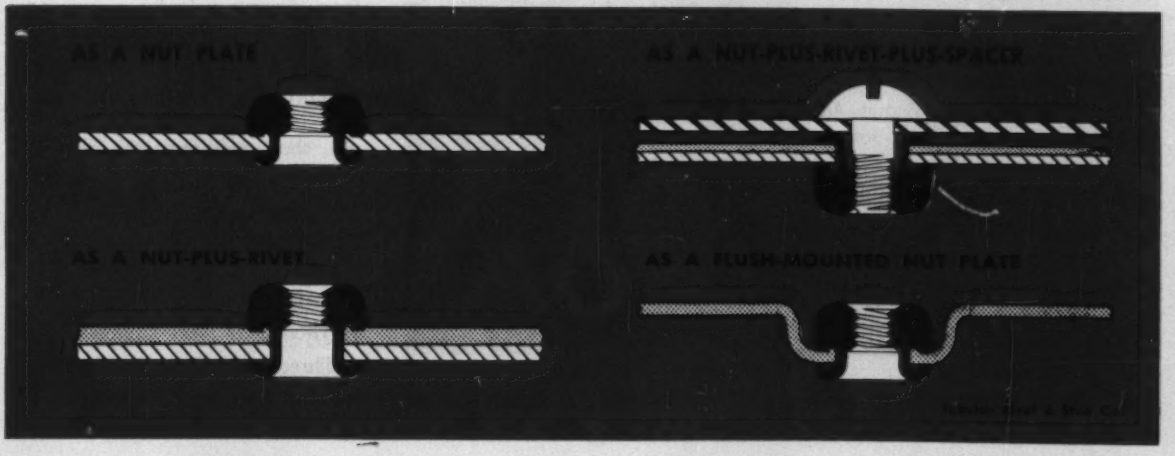
The Perma-Nut combines the speed of a rivet and the strength of a nut. It's actually a threaded rivet that can be applied automatically.

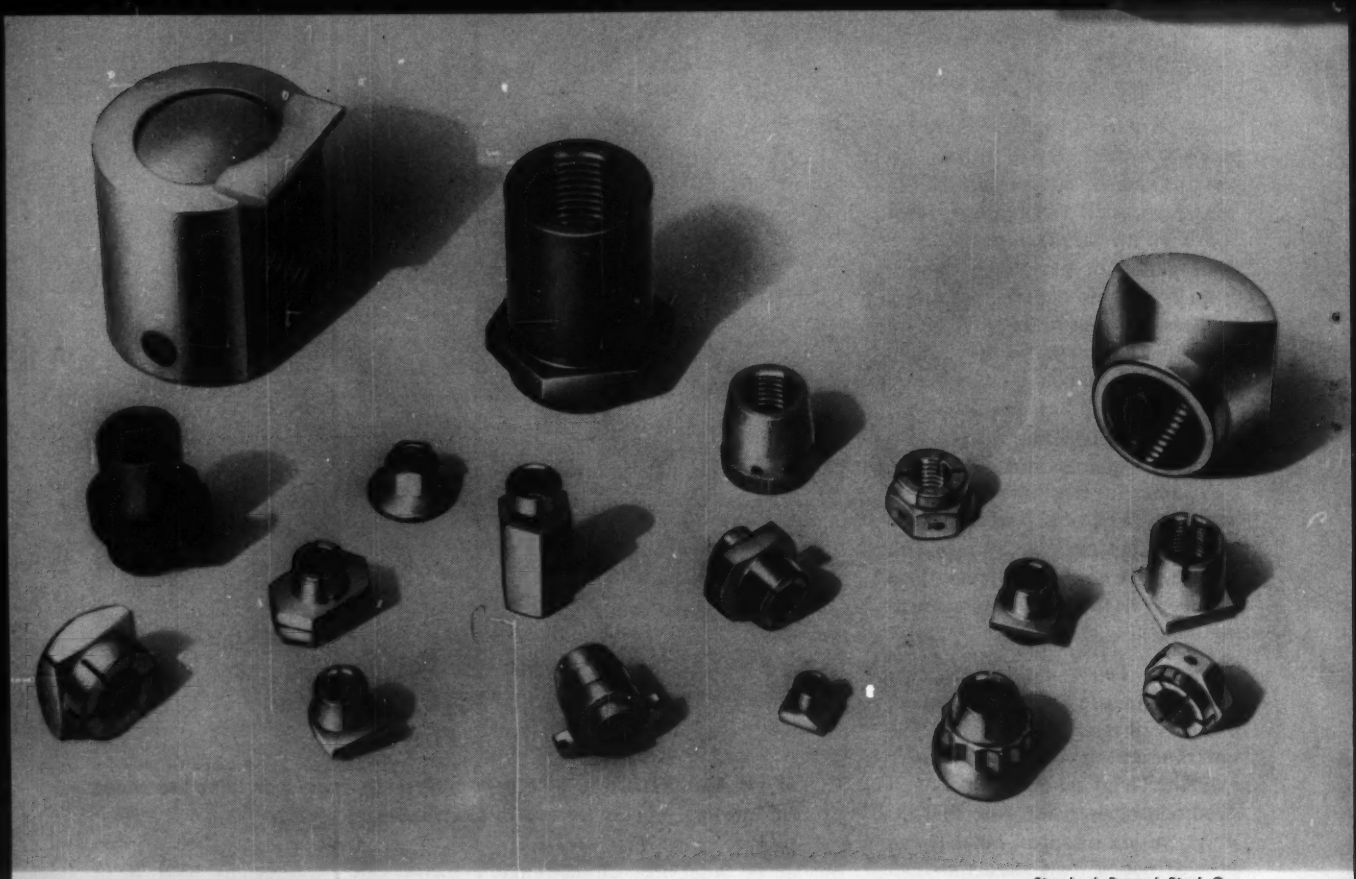


The Carpenter Steel Co.

COLD HEADING: Close to 6000 stainless fasteners per hour are made by cold heading process for use in electrical appliances.

Fastener Has Rivet Speed and Nut Strength





Standard Pressed Steel Co.

SPACE AGE SPECIALS: Custom-made lock and stop nuts answer the heavy demands of missiles and aircraft.

■ How to Get More for Your Special Fasteners Dollar | **Section 3**

How Industry Puts Them to Work

There's no limit to the potential of special fasteners.

By noting some of the present industrial uses, you can develop many practical ideas for your own operation.

■ Too often, progress is just taken for granted. Remember that door that wouldn't shut? How about the latch on the panel door that had to be pried open or the vibrating machine tool? Think of all the rattles and squeaks in the family car.

All these old troubles are disappearing from the scene. Give the credit to special fasteners. They deserve it.

A likely prospect for specials wants to know how and where other companies are using them. There's no better way to illustrate some of these advantages than to sketch a few case histories.

The Big Screen—In planning a new model of TV sets, designers included a new fuse socket. The socket was a must, but its shape was such that it looked like the old TV chassis was no longer practical. However, a custom-made fastener (spring-tension type) solved the problem. This rescued the backlog of old chassis from the junk pile and eliminated any charge for re-tooling.

Spring-tension nuts allow for easier mounting of tub to support members on washing machines. Similar fasteners are also used to attach molding clips to the top panel of automatic washers. Push-on nuts fasten the air diffuser onto air conditioners. In this case, a single nut replaces three fasteners.

Strip Form—Similar nuts in strip form deserve a look-see, too. One company assemblies louvers for gas heaters in such a manner. Once fastened, the operator merely snaps the strip away from the fastened nut, then goes onto the next job.

Special fasteners probably hold the exterior trim to your freezer doors. Similar self-threading nuts appear on hi-fi radio sets. Here, they fasten diecast panels to the vinyl-covered steel cabinets.

Three major uses for the Nylok fastener point up its versatility. On a famous car, they are being used

to bolt oil pans. There's no leakage. Also, the gasket compression is uniform.

Shock Stopper—Another area is in the trigger guard of a shot-gun. Here, it holds the trigger guard to the receiver permanently, despite severe shock. They're used to lock and seal truck transmissions. You'll find them doing other jobs, too, in truck engines.

Nylok fasteners are respected in electronics, too. One research group put them through a gruelling test. Adjusting screws in telephone relays were subjected to 110 million cycles. They came through with flying colors.

How reliable are Nylok fasteners? Railroad track joint bars are fastened by them. In one instance, the bolts remain tight—they haven't backed off at all. That's after one year's service.

Nylok fasteners fit into rockets and missiles. You'll find them in the skin, the guidance system, the electronic components and even in the nose cone. A major auto maker tried these fasteners in door striker plates. The news is good. The screws don't loosen any more.

Electrical Field—Tubular rivets from blueprint designs cover a wide range. A few of the uses are on electrical terminals, cam followers, transformer studs and heat-retainer fuse components.

Where is blind riveting being used? The list is long, but varied. The curved panels inside trailers are fastened by blind rivets. This method does several jobs on aluminum rainspouts, too.

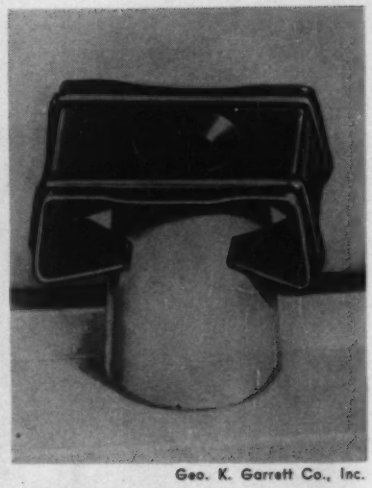
Where can you use drive rivets? Industry uses them in many ways. They join metal panels to the exteriors of truck bodies or to fasten highway signs to metal poles. Drive rivets also secure kick-plates onto storm doors. Damaged panels can even be repaired with them.

Door Design—Some of the doors at a major airline terminal are held together by explosive rivets. The architect and the fabricator both agreed. To the former, it meant clean appearance. To the latter, they were easy to install, inexpensive and strong. They also fasten soda fountains, picnic equipment and milk coolers.

Quick-release fasteners are commonly used in aircraft. Other industries also use them. They're used in telephone terminal mountings, belt-drive housing covers, bookkeeping machines, geared motor couplings and adding machines.

A worth-while application for coiled spring inserts can be found in the electronics field. In a high-speed printing unit that handles 100,000 characters per minute, the insert insures precise adjustment of solenoid armature travel. This fastener is mounted on an aluminum plate where it's subjected to repeated impact.

Pin Jobs—Pins of heat-treated spring steel act as fasteners and pivots for linkages in clutches. Then, too, you'll see these fasteners in socket wrenches where they provide maximum mobility. Re-usable pins are also helpful to attach rollers and gears to shafts.



Geo. K. Garratt Co., Inc.

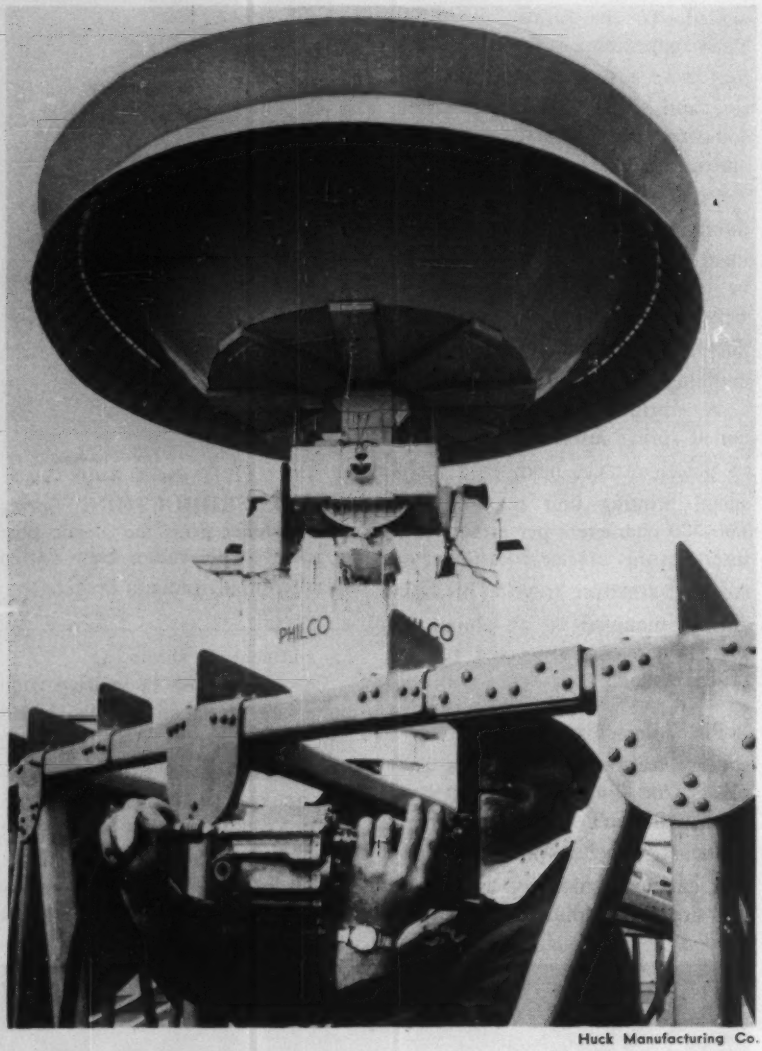
RADIO PRODUCTION: Spring steel fastener grips the plastic boss in table model radio. New design speeds output, reduces breakage.

Great quantities of knurled neck bolts are designed to be driven into wheel hubs. The knurls cut into the hubs to prevent turning. A special nut clamps the wheel.

To keep the height of washing machines even, special bolts are inserted into the legs. These bolts are untrimmed with over-sized pan

Simmons Fastener Corp.

MISSILE CONTAINER: The Falcon missile depends upon special fasteners to lock vehicle in its container. Sealing is water-tight and strong.



Huck Manufacturing Co.

BLIND RIVETS: More than 30,000 blind rivets were used to assemble huge aluminum antenna. Pneumatic power tools helped speed the assembly.

heads. Bolts with special heads in guard rails help prevent accidental injuries by reducing the dangerous protrusions. Power mowers contain double-threaded bolts to ease positioning on floating wheel arms.

Vacuum cleaners rely on nut-type rivets to fasten parts to end plates and shells. In a recessed lighting fixture, the cover is hinged to permit easy access for bulb replacement. The cover is held by slotted hinge arms which slide on pins secured to the fixture case. The fasteners act as the hinge pins plus the threads for the case attachment.

Stitching Seams — One heating and ventilating contractor, by using metal stitching, has reduced labor costs 50 pct. This company can assemble one duct section with as few as 50 stitches. The job: Fasten metal stiffeners and fiberglass insulation to metal air duct sections. Similar results are found in many other companies.

Metal stitching is being used on air distribution valve bridges for ceiling panels, and on aluminum window frames. The auto industry finds the method helpful to attach rubber molding strips to fender skirts.

In one instance, retaining rings act as cams. As such, they activate the timing device in addressing machine equipment.

To sum up, rivets are valuable to the aircraft industry in both primary and secondary structural jobs. Many rivets are designed to drive into inaccessible areas and to attach hollow tubing to fabricated parts. Contractors use them to build laminated plastic awnings, roofing and siding material. Tacking jobs depend on rivets.

Repair Tools—Inserts are good maintenance tools. Why tear down an assembly just because worn threads have outlived their use? Repair them with inserts. Salvage workers know they come in handy. Inserts also fill the bill in structures when the bolts are removed, then put back, many times a year. Inserts permit the parent metal to retain its original properties.

Threaded male fasteners, when applied to shipping crates, keep the delicate product inside from tilting. Bolts take on the vital tasks of fastening cylinder heads, flywheel housings and connecting rods. There's no second chance if failure occurs in internal combustion engines. Special bolting, impervious to heat, keeps vibration down and prevents leakage.

The right special bolt ignores the high pressures that come from active motors. Special screws aid the designers of appliances and signs where blemish-free surfaces are required. They attach covers, conduit clamps or spring assemblies to cast iron, steel and other metals.

Stud welding is efficient to field-assemble insulated aluminum curtain wall. As shear connectors for composite construction of reinforced structures, stud welding is making great strides.

Self-Tapping—Threaded screws are available that are self-threading. At the same time, these fasteners remove the displaced metal from the newly-tapped hole. The auto industry uses specials to attach anti-squeak upholstery or trim pads to its metal bodies.

Jobs for special nuts are in the thousands. Machinery and rolling

stock depend on them to hold conventional nuts in place. The auto industry uses many types of special nuts for connecting rods, shock absorbers and spring shackles.

In aircraft, they attach wing tips to wings, cabin air ducts and frames for doors and windows. On the other hand, the electronics field finds special nuts useful to provide tapped holes to hold tube clamps, partitions, covers and other parts.

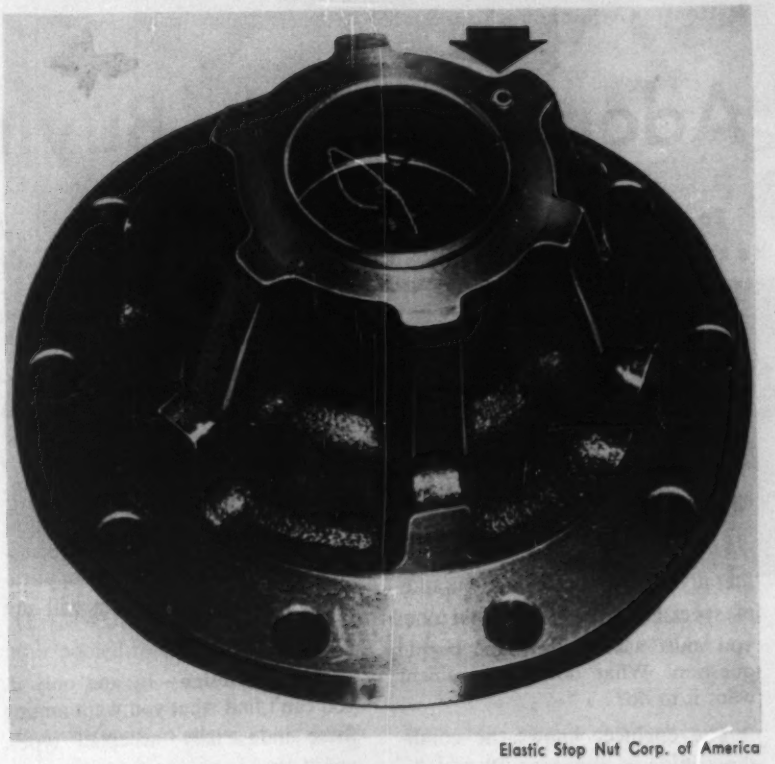
They also eliminate costly delays from tiresome interferences like paint clogging and freezing of screw threads. Nuts make good spacers between the inner liner and the evaporator on refrigerators. They stand up to the exposure of high heat when fastening insulators to switches. The Army puts them in its tanks, both tracks and sprockets.

On the Sea — Special washers provide leak-proof seals in bulkheads. Contaminants are sealed out of pressurized fuselages in aircraft by tight-fitting washers. They also find many areas in the auto industry to cut down on vibration.

The big customer right now for quick-release fasteners is the aircraft field. You'll find them holding down airborne equipment on carriers where they're exposed to trying conditions. These devices also fasten radio sets to shock absorbers, and they hold tubes and fuses, too.

Quick-release fasteners, like other specials, handle the gamut from huge assemblies to minute parts. Landing gear covers, panels and inspection doors rely on them to satisfy service requirements.

There's no limit to the potential of special fasteners. Sometimes, all it takes is a fastening idea. From that point on, it's up to the designers. Few problems stump these engineering experts.



Elastic Stop Nut Corp. of America

HELD IN PLACE: Heat-treated spring pin prevents thrust bearing from rotating. Use of re-usable pin eliminates reaming of holes.

Special Fasteners Serve Many Industries

Aircraft
Trucks, Buses
Railroad Cars
Shipbuilding
Conveyors
Duct Work
Machinery
Windows, Doors
Automobiles
Air Conditioners
Radios, TV Sets
Office Furniture
Electric Signs
Building Construction
Refrigerators
Marine Equipment
Toys
Missiles
Heating Equipment
Kitchen Equipment
Tanks
Metal Cabinets
Electronic Equipment
Honeycomb Structures
Extrusions
Diesel Engines
Power Tools
Containers
Instruments
Shelving
Weapons
Atomic Energy Equipment
Earth-Moving Equipment
Pumps
Washing Machines
Stoves
Boilers
Lighting Fixtures
Cameras
Clocks
Regulators
Radar Equipment
Signal Apparatus
Machine Tools
Business Machines
Generators
Control Boards
Vending Machines

Adopt Sensible Buying Habits

To get what you want from a new fastener, many conditions must be studied.

Unnecessary fastener frills can be trimmed by the combined talents of maker plus user.

■ Once you're sold on the idea of special fasteners, your next step is purchase. This is not so difficult as it might seem. True, there are literally thousands and thousands of specials. To find the right one, you must ask yourself one simple question: What does management want it to do?

The engineer knows the conditions the new fastener will be subjected to. The production man can help, too. He knows the details on schedules and sizes of runs. Armed with these data, you are now ready for the big plunge: Find the fastener or combination of fasteners that will meet these demands.

Like anything else, the more familiar you become with the sources of supply the easier the job of purchasing. First explore those specials that can be shipped from stock. The shipping angle is just one factor. These fasteners have been used successfully in any number of applications. Maybe one of them will suit your present needs.

Custom Design—If, and only if, you can't find what you want among these industrially-accepted types, you'll have to start thinking in terms of custom design. The latter is a costly venture. Its higher cost can be justified if your production runs are big enough, or if safety is imperative.

As the man whose signature goes on the order, the purchasing agent plays a major role in the field of fasteners. He must see to it that the price is fair and that the shipping date is realistic. He should also favor quality in the fastener he buys.

It's vital to know which manufacturers to contact when new fasteners are required. When ordering a special fastener, it's a comfort to know that the last fastener in the lot is an exact duplicate of the first one. Only reliable manufacturers can exert that kind of control over quality and dimensions.

Reliable Source—When the sales-

CAREFUL APPROACH: Liaison between manufacturer and user points to one goal: the most efficient fastener.
Shakeproof, Div. of Illinois Tool Works

man comes to call, make sure that the company he represents has the facilities and experience to devote genuine hours to your problem. Don't forget. The manufacturer should be equipped to do a lot of your design thinking for you.

As soon as the needed data have been submitted, actual design begins. From then on, the liaison will be between the manufacturer and your own design engineers. However, make sure that both of these groups are aware of the time factor. If samples are needed, they will have to be in the plant on schedule. The same is true for production parts.

Suppose your production run is too short to justify the overall cost of a custom-designed fastener. Then go through the catalog items and find several fasteners that come close to what you're after. Chances are, with a few added wrinkles, you can come up with the one you want.

Explore the Field — After all sources of "off shelf" supply have been exhausted, you'll have to direct your attention to the concept of the "blueprint" fastener.

Consider a few types of fasteners on your own. Also, have detailed prints made up of these types. Use some imagination, though. Include the various styles of fasteners in your thinking.

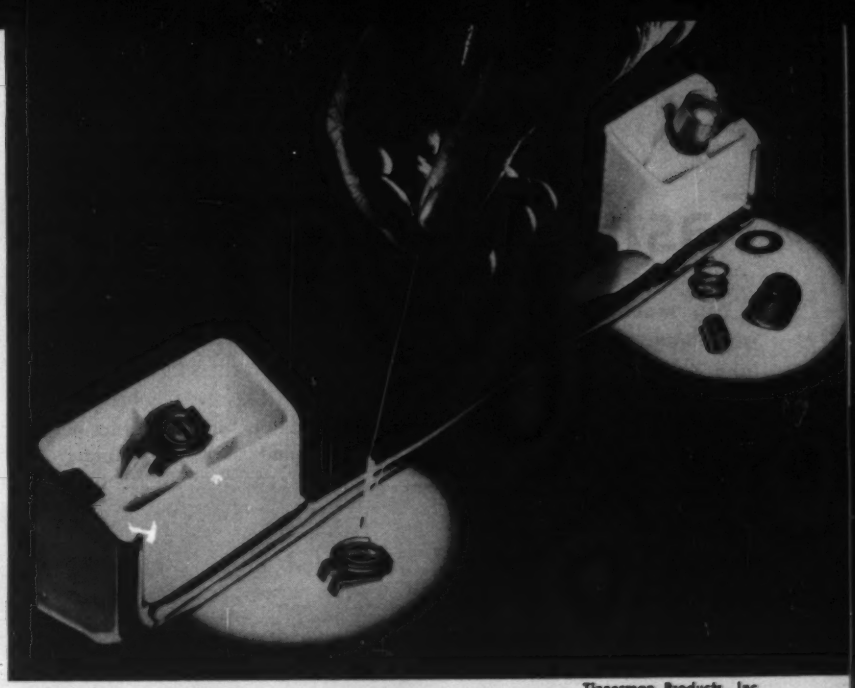
Very often, samples will be needed for testing. Estimate how many samples you will need and the ideal date to receive them. Also, figure out how many you'll need on your first order and when that shipment should reach the plant. Timing depends on whether your model is in production now or still in the development stage.

Open Mind—Try not to limit the designer's freedom. This includes the dimensions of the present assembly as well as fabrication methods. The same applies to material, screws, studs and holes.

The part in use is another factor. What are the conditions that might affect it? Certainly, humidity and heat could cause trouble. If you expect vibration to occur, stand ready to explain the nature of such vibrations. The design engineer will also have to know what to expect in tensile strength, torque and shear load.

What design factors in the product itself will affect the fastener? Think in terms of special tolerances and material and finish of adjoining parts. Keep an eye out for safety measures like rounded corners, too.

The designer may be able to give you more for your money by using some material other than the one you specify. A second choice can sometimes be used to greater advantage. Does the new fastener have to be of a certain thickness, hardness and finish? If so, can you allow for any leeway?



Tinnerman Products, Inc.

TEAMWORK: To fasten the door handle on kitchen range, maker and user pooled their thinking, ended up with one fastener instead of four.

Let Checklist Be Your Guide

Jobs for purchasing . . .

- Lead time
- Quantity
- Samples
- Source of supply
- Delivery
- Initial cost
- Speed of assembly
- Cost of assembly

Engineering duties . . .

- Dimensions
- Material
- Vibration
- Method of assembly
- Tolerances
- Finish
- Thickness
- Hardness
- Operating conditions
- Humidity
- Temperature
- Tensile strength
- Torque
- Shear load
- Design limitations
- Re-usability

Fast Methods Speed Production

Top management would like to see more automation in its long fastening lines. It can be done.

Special fasteners are adaptable to power tools. Fast methods are available, too.

■ The special screw that can be hopper fed into position, then tightened with a power screwdriver, appeals to the production man. Unfortunately, not all fasteners are quite ready for this stage. Equipment is available to lock fasteners in place at a high rate, but the present trend leans toward custom-made tooling.

Automation, even though it might be just a manually-controlled power tool, can handle most special fasteners. With new design avenues opening up every day, it's a question of time before specials move into very high gear.

Three Methods—If the accent is on speed, there are several fastening methods worth studying.

Types like the Chobert and Pop rivets can be driven at rates between 1000 and 2000 per minute. One pioneer company in riveting offers a wide choice of over 200 different machines.

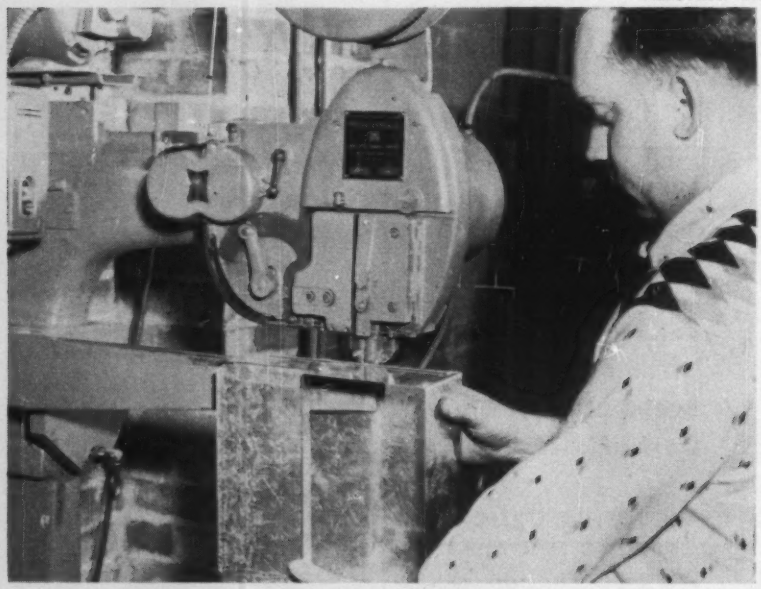
Most people associate stapling with paperwork. Why not apply the same principle to metals? It's being done under the name of metal stitching. Wire is fed from a coil. In one continuous operation, the wire is cut to length, formed, driven through the workpiece and clinched.

In many companies, metal stitching is used to join dissimilar metals, too. Time required to make one single stitch is only one-fifth of a second. You can stitch any material that doesn't fracture.

Welded in Place—In stud welding a portable gun is used to weld a variety of fasteners to workpieces. This process is another blind fastening method. As long as the studs can be flux loaded, fitted with a ferrule, and remain within the capacity of the welding machine, the process has no limits.

The newer power tools do more than just fasten. Several are available, for example, that inspect while they drive.

Acme Steel Co.



METAL STITCHING: One man metal stitches 100 sheet-metal register heads per hour. Heads are used in heat and air-conditioning systems.

Acknowledgements — Special thanks go to those companies that helped make this feature possible: Acme Steel Co.; Allegheny Ludlum Steel Corp.; An-Cor-Lox Div.; Armco Steel Corp.; Associated Spring Corp.; Aviation Developments, Inc.; Carpenter Steel Co.; C.E.M. Co.; Columbia Nut & Bolt Co., Inc.; C.S.M. Screw Prods. Co.; du Pont Co., Inc.; Elastic Stop Nut Corp. of America; Fastex Div.; Geo. K. Garrett Co., Inc.; Groov-Pin Corp.; Heli-Coil Corp.; Hi-Shear Rivet Tool Co.; Huck Mfg. Co.; Industrial Fastener Institute; Klincher Locknut Corp.; Maclean-Fogg Lock Nut Co.; National Machine Prods. Corp.; National Screw & Mfg. Co.; Nelson Stud Welding Div.; Nylok Corp.; Palnut Co.; Penn Engrg. & Mfg. Co.; Philco Corp.; Precision Rubber Prods. Corp.; RCA; Reynolds Metals Co.; Security Locknut Corp.; Shakeproof Div.; Shur-Lock Corp.; Simmons Fastener Corp.; Southco Div.; Standard Pressed Steel Co.; Star Expansion Industries Corp.; Judson L. Thomson Mfg. Co.; Tinnerman Prods., Inc.; Townsend Co.; Tubular Rivet & Stud Co.; United-Carr Fastener Corp.; United Shoe Machinery Corp.; Worcester Taper Pin Co.; and Lamson & Sessions Co.

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STAYS STABLE, PROTECTS AGAINST CORROSION

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Dow also offers ALK-TRI®, the amine-stabilized tri with powerful solvency, and HI-TRI®, the trichloroethylene for cold cleaning missile components. HI-TRI has excellent shock sensitivity properties and leaves little or no residue.

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ASK YOUR DISTRIBUTOR of Dow solvents for this booklet on trichloroethylene. It highlights the features of NEU-TRI as a fast, efficient vapor degreasing solvent. Get in touch with your distributor or write to your nearest Dow sales office.

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LETTER KEYS: (C)—Chlorothene® NU; **(M)**—Methylene Chloride; **(P)**—Perchloroethylene (Industrial); **(T)**—Trichloroethylene

ALABAMA
BIRMINGHAM—Wittichen Chemical Company (C M P)
BIRMINGHAM—F. H. Ross & Company, Inc. (C M P)
MOBILE—McKesson & Robbins, Inc. (C M P T)
MOBILE—F. H. Ross & Company, Inc. (C M)
MONTGOMERY—Wittichen Chemical Company (C M P)

ARIZONA
PHOENIX—Braun Chemical Company (C M P T)
PHOENIX—Western Chemical Company (C M P)
TUCSON—Western Chemical Company (C M P)

CALIFORNIA
LOS ANGELES—Braun Chemical Company (C M P T)
LOS ANGELES—McKesson, Mefford Chemical Division (P)
LOS ANGELES—Pemaco, Inc. (P T)
SAN DIEGO—Braun Chemical Company (C M P T)
SAN FRANCISCO—Braun-Knecht-Heimann Co. (C M P T)
SAN FRANCISCO—G. N. Meacham Company (C)

COLORADO
DENVER—Braun-Knecht-Heimann Company (C M)
DENVER—Chemical Sales Company (C M P T)
DENVER—McKesson & Robbins, Inc. (C M P T)
DENVER—Mine and Smelter Supply Company (C M P T)
GRAND JUNCTION—C. D. Smith Co., Chemical Div. (C P T)

CONNECTICUT
HARTFORD—Dwight R. Judson Company (C T)
NEW HAVEN—H. Krevit and Company, Inc. (C P T)
SHELTON—Axton-Cross Company (C M P T)
SOUTH NORWALK—Guard-All Chemical Co. (C M P T)
STAMFORD—McKesson & Robbins, Inc. (C M P)
WATERBURY—Hubbard Hall Chemical Company (M)

FLORIDA
JACKSONVILLE—F. H. Ross & Company, Inc. (C M P)
JACKSONVILLE—Amica Burnett Chemical Co. (C M P T)
MIAMI—Amica Burnett Chemical Co. (C M P T)
MIAMI—Biscayne Chemical Laboratories (C M P)
ORLANDO—Atlantic Chemicals, Inc. (C M P T)
TAMPA—Amica Burnett Chemical Co. (C M P T)
TAMPA—Atlantic Chemicals, Inc. (C M P T)
TAMPA—McKesson & Robbins, Inc. (C M P T)

GEORGIA
ATLANTA—Chapman Chemical Company (T)
ATLANTA—McKesson & Robbins, Inc. (C M P T)
ATLANTA—F. H. Ross & Company, Inc. (C M P)
ATLANTA—Southern States Chemical Co. (C M P T)
BIRMINGHAM—Chapman Chemical Company (T)
COLUMBUS—F. H. Ross & Company, Inc. (C M P)
DUBLIN—Textile Aniline Chemical Company (T)

IDAHO
BOISE—Van Waters & Rogers, Inc. (C M P)

ILLINOIS
AURORA—River Valley Chemicals, Inc. (C M P T)
CHICAGO—Central Solvents & Chemicals Co. (C M P)
CHICAGO—C. P. Hall Company of Illinois (C M P T)
CHICAGO—McKesson & Robbins, Inc. (C M P T)
CHICAGO—Joseph Turner & Company (C M P T)
DECATUR—McKesson & Robbins, Inc. (C M P T)
EFFINGHAM—Wabash Independent Oil Company (C P T)
MELROSE PARK—London Chemical Company, Inc. (P T)
PEORIA—McKesson & Robbins, Inc. (C M P T)
ROCKFORD—Industrial Oil & Chemical Company (C)
ROCKFORD—Viking Chemical Company (C M P T)

INDIANA
EVANSVILLE—Barning Industrial Chemicals, Inc. (C M P T)
EVANSVILLE—Charles Leich and Company (P)
FT. WAYNE—Hoosier Solvents & Chemicals Corp. (C M P)
FT. WAYNE—Inland Chemical Corporation (C M P)
HAMMOND—Inland Chemical Corporation (C M P T)
INDIANAPOLIS—Hoosier Solvents & Chemicals Corp. (C M P)
INDIANAPOLIS—Wm. Lynn Chemical Co., Inc. (C M P)
INDIANAPOLIS—Ulrich Chemical Company, Inc. (C T)
KOKOMO—Plating Products, Inc. (T)
LOGANSPORT—Plating Products, Inc. (T)
SOUTH BEND—Inland Chemical Corporation (C M P T)
SOUTH BEND—Stevens Company (C M P)

IOWA
BETTENDORF—Barton Naphtha Corporation (C M P)
BURLINGTON—McKesson & Robbins, Inc. (C M P T)
CEDAR RAPIDS—McKesson & Robbins, Inc. (C M P T)
COUNCIL BLUFFS—Barton Solvents Co. (C M P T)
DAVENPORT—McKesson & Robbins, Inc. (C M P T)
DES MOINES—Barton Naphtha Company (C M P T)
SUMNER—Overton Chemical Sales (C)

KANSAS
WICHITA—McKesson & Robbins, Inc. (C M)

KENTUCKY
LOUISVILLE—Dixie Solvents and Chemicals Co. (C M P)
LOUISVILLE—Gans Chemical and Supply Company (P)
LOUISVILLE—McKesson & Robbins, Inc. (C M P T)

LOUISIANA
BATON ROUGE—McKesson & Robbins, Inc. (C)
NEW ORLEANS—McKesson & Robbins, Inc. (C)
NEW ORLEANS—Southern Solvents and Chemicals (C M P T)

MAINE
LEWISTON—Polar Chemical Company (C M P T)

MARYLAND
BALTIMORE—Leidy Chemicals Corporation (C M P)
BALTIMORE—Seiler-Hughes Chemicals, Inc. (C)
BALTIMORE—Tilley Chemical Company (T)

MASSACHUSETTS
BOSTON—Howe and French, Inc. (C M)
BOSTON—Linder and Company, Inc. (C M P T)
BOSTON—McKesson & Robbins, Inc. (C M P T)
EVERETT—Sessions-Gifford Co., Inc. (C M P T)
FRAMINGHAM—Axton-Cross Corp. of Mass. (C P T)
HINGHAM—Stephen-Roger, Inc. (C M P T)
SPRINGFIELD—Chemical Corporation (C M P T)
SPRINGFIELD—Hampden Color & Chem. Co. (C M P)
STONEHAM—George Mann & Company, Inc. (C M P T)
WESTFIELD—Eastern Chemicals, Inc. (M)
WORCESTER—George H. Clark and Co. (C M P T)

MICHIGAN
DETROIT—Eaton Chemical & Dyestuff Company (C M)
DETROIT—Manpro Corporation (C M P T)
DETROIT—McKesson & Robbins, Inc. (C M P T)
DETROIT—Western Solvents & Chemicals Company (C M P)
DETROIT—Whitfield Chemical Company (P)
ESCANABA—Haviland Products Company (C M P)
FERNDALE—Manpro Corporation (C M P T)
GRAND RAPIDS—Haviland Products Company (C M P)
GRAND RAPIDS—McKesson & Robbins, Inc. (C M P T)
GRAND RAPIDS—Wolverine Solvents & Chemicals Co. (C M P)
LANSING—Carrier Stephens Company (C M P)
LANSING—Wheaton Chemical Company (C P)
SAGINAW—McKesson & Robbins, Inc. (C M P T)

MINNESOTA
MINNEAPOLIS—W. H. Barber Company (P T)
MINNEAPOLIS—McKesson & Robbins, Inc. (C M P T)
ST. PAUL—Lyons Chemicals, Inc. (C M P)

MISSISSIPPI
JACKSON—F. H. Ross & Company, Inc. (C M P)

MISSOURI
KANSAS CITY—McKesson & Robbins, Inc. (C M)
KANSAS CITY—Missouri Solvents and Chemicals Co. (C M P)
KANSAS CITY—Sherwood and Company, Inc. (C M P T)
ST. LOUIS—McKesson & Robbins, Inc. (C M P T)
ST. LOUIS—Independent Oil Company (C M P T)
ST. LOUIS—G. S. Robins and Company (C M P)
ST. LOUIS—Missouri Solvents and Chemicals Co. (C M P)

NEBRASKA
OMAHA—Barton Solvents Company (C M P T)
OMAHA—McKesson & Robbins, Inc. (C M P T)

NEW JERSEY
BLOOMFIELD—McKesson & Robbins, Inc. (C M P)
CAMDEN—Callahan Chemical Company (C M P T)
EAST PATERSON—Aetna Chemical Corp. (C M P T)
MURRAY HILL—American Mineral Spirits Co. (C M P T)
NEWARK—American Oil and Supply Co. (C P)
NEWARK—National Oil and Supply Company (C M P T)
PALISADES PARK—Philip A. Hunt Company (C)
PERTH AMBOY—Modern Solvents & Chemicals Corp. (M P T)
RIVERDALE—A. H. Mathieu Company (P)
SOUTH KEARNY—American Chemicals, Inc. (C M P T)
VINELAND—Lirio Chemical Company (C P T)

NEW MEXICO
ALBUQUERQUE—Braun Chemical Company (C M P T)
ALBUQUERQUE—Edmunds Chemical Company (C M P T)

NEW YORK
ALBANY—Krackler & Campbell, Inc. (M)
ATHENS—Spick Products Company (P T)
BINGHAMTON—Collier Chemicals, Inc. (P T)
BRONX—Elco Solvents Corporation (M P T)
BROOKLYN—Enequist Chemical Company (C P)
BUFFALO—Buffalo Solvents and Chemicals (C M P)
BUFFALO—Chemical Sales Corporation (C M P T)
BUFFALO—McKesson & Robbins, Inc. (C M P T)
GARDEN CITY—Hogan Industrial Supply Corp. (C M P T)
GLOVERSVILLE—Eastern Chemicals, Inc., S. H. Ireland Div. (C M)
KEARNY—American Chemicals, Inc. (C M P T)
LONG ISLAND CITY—Peerless Oil and Chemical Corp. (C M P T)
NEW YORK—American Chemicals, Inc. (C M P T)
NEW YORK—McKesson & Robbins, Inc. (C M P)
POUGHKEEPSIE—Duso Chemical Company (C)
RENSSELAER—Eastern Chemicals, Inc. (C M)
ROCHESTER—Chemical Sales Corporation (C M P T)
SYRACUSE—Eastern Chemicals, Inc. (C M)
UTICA—Monarch Laboratories (C M P)

NORTH CAROLINA
CHARLOTTE—F. H. Ross & Company, Inc. (C M)
CHARLOTTE—Moreland Chemical Company (C M P T)
CHARLOTTE—Southern States Chemical Co. (C M P T)
GREENSBORO—F. H. Ross & Company, Inc. (C M)

OHIO
AKRON—Farley Solvents Company (C M P T)
AKRON—C. P. Hall Company (C M P T)
CANTON—Bison Corporation (C M P)
CINCINNATI—Amsco Solvents and Chemicals Co. (C M P)
CINCINNATI—Chipman Supply Company (T)
CINCINNATI—Herbert Chemical Company (P T)
CINCINNATI—McKesson & Robbins, Inc. (C M P T)
CLEVELAND—Man-Gill Chemical Company (C P T)
CLEVELAND—McKesson & Robbins, Inc. (C M P T)
CLEVELAND—National Solvents Corporation (C P T)
CLEVELAND—Ohio Solvents and Chemicals, Inc. (C M P)
CLEVELAND—R. W. Renton Company (C P T)
COLUMBUS—McKesson & Robbins, Inc. (C M P T)
DAYTON—Industrial Chemical Products Co. (C P T)
DAYTON—Ottoson Solvents, Inc. (T)
LIMA—Thomson Chemical Company (C M P T)
TOLEDO—Inland Chemical Co. (C M P)
TOLEDO—Toledo Solvents and Chemicals (C M P)
TOLEDO—M. I. Wilcox Company (C P T)
YOUNGSTOWN—Rhiel Supply Company (C M P T)

OKLAHOMA
OKLAHOMA CITY—McKesson & Robbins, Inc. (C M P T)
TULSA—McKesson & Robbins, Inc. (C M P T)
TULSA—Chemical Products, Inc. (C M P T)

OREGON
PORTLAND—Van Waters & Rogers, Inc. (C M P)

PENNSYLVANIA
CONSHOHOCKEN—American Mineral Spirits Co. (C M P T)
EASTON—Lehigh Valley Chemical Company (C M P T)
ERIE—Monarch Laboratories (T)
LEESPORT—R. W. Eaken, Inc. (C M P T)
McKEES ROCKS—Apex Soap and Sanitary Corp. (C P T)
PHILADELPHIA—Alex C. Fergusson Company (C P T)
PHILADELPHIA—McKesson & Robbins, Inc. (C M P T)
PHILADELPHIA—Phillips and Jacobs, Inc. (C M)
PHILADELPHIA—Pioneer Salt Company (C M P T)
PHILADELPHIA—George Senn, Inc. (C M P T)
PITTSBURGH—Carmac Chemical Company, Inc. (C P)
PITTSBURGH—Carman-Pittsburgh Company, Inc. (C)
PITTSBURGH—Ft. Pitt Chemical Company (C)
PITTSBURGH—McKesson & Robbins, Inc. (C M P T)
READING—Textile Chemical Company (C P)
SCRANTON—Scranton Chemical Company (C P T)
YORK—Industrial Solvents and Chemicals Co. (C P T)

RHODE ISLAND
CRANSTON—Giffordline Chemical Company (C M P T)
PROVIDENCE—George Mann & Company, Inc. (C M P T)
PROVIDENCE—Sessions-Gifford Company, Inc. (C M P T)

SOUTH CAROLINA
CHARLESTON—Burris Chemical Company (C P T)
GREENVILLE—F. H. Ross & Company, Inc. (C M)
GREENVILLE—Southern States Chemical Co. (C M P T)
SPARTANBURG—Moreland Chemical Co., Inc. (C M P T)

TENNESSEE
CHATTANOOGA—Chapman Chemical Co. (C M P T)
CHATTANOOGA—Wilson Sales Company (C M P T)
KINGSPORT—Chem-I-Dent, Inc. (C P T)
MEMPHIS—Chapman Chemical Company (C M P T)
MEMPHIS—C. P. Hall Company (C M P T)
MEMPHIS—Ideal Chemical and Supply Co. (C M P T)
NASHVILLE—Chapman Chemical Company (C M P T)
NASHVILLE—Wilson Sales Company (C M P T)

TEXAS
AMARILLO—State Chemical Company (C M P T)
AUSTIN—R. M. Hughes Company, Inc. (C M P T)
BEAUMONT—Arthur Dooley and Son (C M P T)
CORPUS CHRISTI—McKesson & Robbins, Inc. (C M P T)
DALLAS—McKesson & Robbins, Inc. (C M P T)
DALLAS—Texas Solvents and Chemicals Co. (C)
DALLAS—Van Waters and Rogers, Inc. (C M P T)
EL PASO—Baron Chemical Company (C M P T)
EL PASO—Braun Chemical Company (C M P T)
EL PASO—Mine and Smelter Supply Company (P)
FORT WORTH—McKesson & Robbins, Inc. (C M P T)
HOUSTON—McKesson & Robbins, Inc. (C M P T)
HOUSTON—W. H. Curtin and Company (P)
HOUSTON—Dixie Chemical Company (C M P T)
HOUSTON—R. M. Hughes Company, Inc. (C M P T)
HOUSTON—Texas Solvents and Chemicals Co. (C M P)
HOUSTON—Van Waters and Rogers, Inc. (C M P T)
LUBBOCK—State Chemical Company (C M P T)
MIDLAND—State Chemical Company (C M P T)
ODESSA—McKesson & Robbins, Inc. (C M P T)
SAN ANTONIO—R. M. Hughes Company, Inc. (C M P T)
SAN ANTONIO—McKesson & Robbins, Inc. (C M P T)
TERMINAL—State Chemical Company (C M P T)

UTAH
SALT LAKE CITY—Braun-Knecht-Heimann Co. (C M P T)

VIRGINIA
RICHMOND—Phipps and Bird, Inc. (C M P T)
ROANOKE—Havnaer Supply Company (C M P T)

WASHINGTON
SEATTLE—Van Waters & Rogers, Inc. (C M P)
SPOKANE—Van Waters & Rogers, Inc. (C M P)

WEST VIRGINIA
BLUEFIELD—Fairmont Supply Co. (T)
CHARLESTON—B. Preiser Company, Inc. (C M P T)
FAIRMONT—Fairmont Supply Company (C P T)
HUNTINGTON—Cabell Chemical Company (C P T)

WISCONSIN
APPLETON—McKesson & Robbins, Inc. (C M P T)
CHIPPEWA FALLS—Lyon Chemicals Co., Inc. (C M P)
LA CROSSE—North Central Chemicals, Inc. (C M P T)
LA CROSSE—Wisconsin Solvents & Chemicals Corp. (C M P)
MADISON—North Central Chemicals, Inc. (C M P T)
MILWAUKEE—Benlo Industrial Chemicals Company (P T)
MILWAUKEE—McKesson & Robbins, Inc. (C M P T)
MILWAUKEE—Wisconsin Solvents & Chemicals Corp. (C M P)
WAUKESHA—F. P. Jay Chemicals, Inc. (C M T)

See Your Distributor of Dow Solvents First!

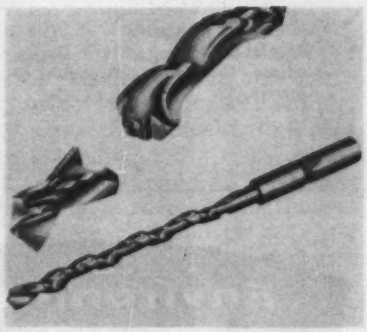
New Materials and Components

Digital-Drive System Provides No-Drift Accuracy

Principal advantage of a new digital control system is its extreme accuracy. On cut-to-length lines, the new system maintains precise cutting to any desired length. Length increments may be calibrated as fine as 1/64 in. Each digital system is custom-tailored to a specific customer's needs. The manufacturer doesn't offer "standard" digital equipment. Printed circuit boards and special-purpose electronic circuits—embedded in a solid block of resilient plastic—provide long, trouble-free life. Individual circuits are built into their own models for easy check-out and replacement. (Reliance Electric and Engineering Co.)

For more data circle No. 25 on postcard, p. 115

Drill Features Replaceable Tips With Oil Holes



Replaceable dual-flute tips extend the life of a new drill. The replaceable cutting edges are available in carbide tips, solid tungsten carbide, or solid high-speed steel. Each tip insures complete interlocking and positive location within the drill's body. Regardless of drill diameter—5/16 to 1 in.—there are two coolant holes in each tip. The single-flute body provides maximum chip clearance. It's effective in deep-hole drilling of aluminum. Cutting lips remain cool, chip removal is inherent and drilling time can be greatly reduced. The new design permits drilling the entire depth of a hole in one pass. (Detroit Reamer & Tool Co.)

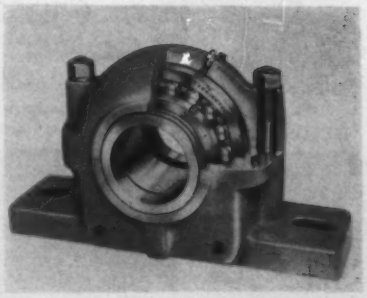
For more data circle No. 26 on postcard, p. 115

Straight Air Grinder Uses Solid-Rubber Wheel

Abrasive belts in desired grits can be slipped over a solid-rubber grinding wheel. In use, the belts are held by centrifugal expansion of the rubber wheel. No mechanical-locking devices are needed. Advantages include: quick belt changes; continuous balance; and finer finishes. The resilient wheel hugs the work. It doesn't bounce like a solid wheel. Self-cleaning abrasive bands, combined with the manufacturer's 6-in. straight air grinders, prove ideal for flat work and/or weld grinding. The grinders are available in speeds of 4500 or 6000 rpm. (Thor Power Tool Co.)

For more data circle No. 27 on postcard, p. 115

Pillow Blocks Have Self-Aligning Roller Bearings



Heavy-duty pillow blocks, with self-aligning roller bearings in split housings, prove useful in a variety of industrial applications. Housing seats are machined to bearing widths, plus 3/8 in. This permits each pillow block to serve as a floating unit. With a standard 3/8-in. wide stabilizing ring in place, each block can be fixed. Spherical roller bearings in the new blocks have high-radical and thrust-load capacities combined with low torque. Bronze retainers for each row of rollers are land riding to reduce friction and provide quiet operation. (The Torrington Co.)

For more data circle No. 28 on postcard, p. 115

EXECUTIVE REPORT #30

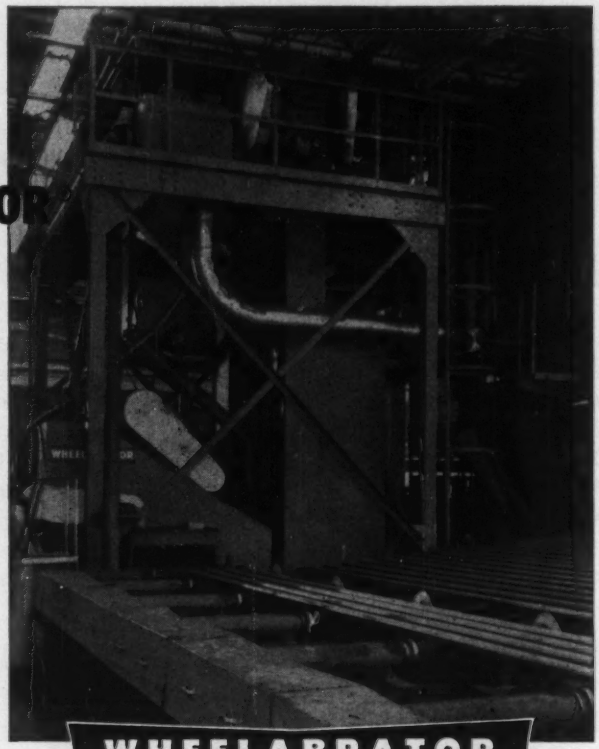
AUTOMATED DESCALING WITH THE WHEELABRATOR

The bar stock cleaning line in the new two million dollar Elyria, Ohio, Cold Draw plant of The Western Automatic Machine Screw Co., Div. of Standard Screw Co. utilizes one of six Wheelabrator descaling machines that have completely eliminated pickling in this modern plant.

On the bar line, the Wheelabrator enables one man to handle the entire operation, from receipt of bar bundles, through an unscrambler, transfer to feed roll conveyors, through the Wheelabrator, and out onto a storage rack in line with the draw bench. For over 16 months of operation, round, square and hex bar stock, up to 4½" diameter in 15' to 45' lengths, has been descaled without any of the old acid pickling headaches. In addition, Western Automatic reports that Wheelabrator descaling provides a definitely superior product for subsequent cold drawing.

How To Automate Your Bar and Wire Drawing Lines

Details of Wheelabrator's cost-saving descaling method are illustrated in Bulletin 148-D. Write to Wheelabrator Corp., 510 S. Byrkit St., Mishawaka, Indiana. In Canada, P.O. Box 490, Scarborough, Ontario.



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For advertising rates, write to Chestnut and 56th Streets, Philadelphia 39

WHO*

In the best circles you'll find they use only . . .

Ottemiller

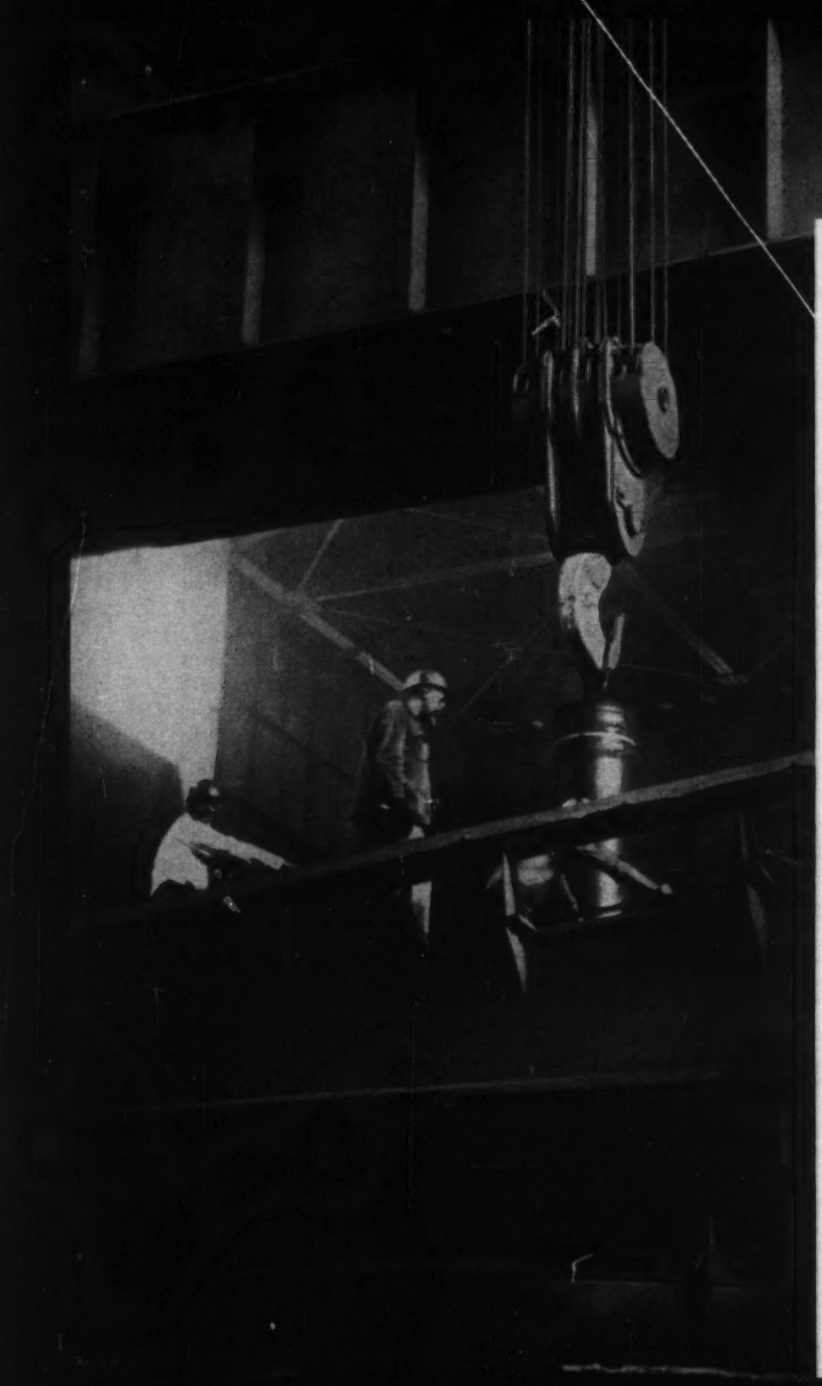
CAP SCREWS · SET SCREWS · MILLED STUDS

CUSTOM SCREW MACHINE SPECIALTIES

*Wm. H. Ottemiller Co.
YORK, PENNSYLVANIA

MAJOR REASONS FOR SPECIFYING NATIONAL ELECTRODES...

QUALITY SERVICE DELIVERY · FACILITIES!



"NATIONAL" electrode service program has been presented to 2500 steel employees

To date, the "National" electrode training program covering storage, handling, assembly, and performance of electrodes has been presented 210 times by NATIONAL CARBON personnel to 2500 steel employees. This is part of a continuous service program designed to help you obtain the maximum product efficiency built into every "National" electrode. In addition, the program includes regular visits by sales and technical service personnel plus observations of shop and melting practices by our engineers skilled in electric furnace operations.

In addition to an active and continuing service program, NATIONAL CARBON provides electrodes that are unsurpassed in quality...delivery operations utilizing the latest equipment available...and the facilities—raw materials and machinery utilized by experienced personnel — of five domestic production plants.

For details, contact National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. In Canada: Union Carbide Canada Limited, Toronto.

"National" and "Union Carbide" are registered trade-marks for products of

NATIONAL CARBON COMPANY

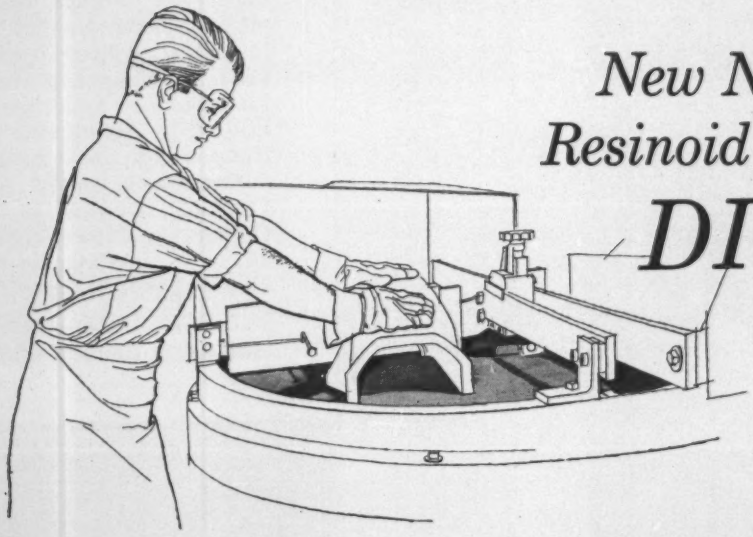
UNION CARBIDE

Announcing:

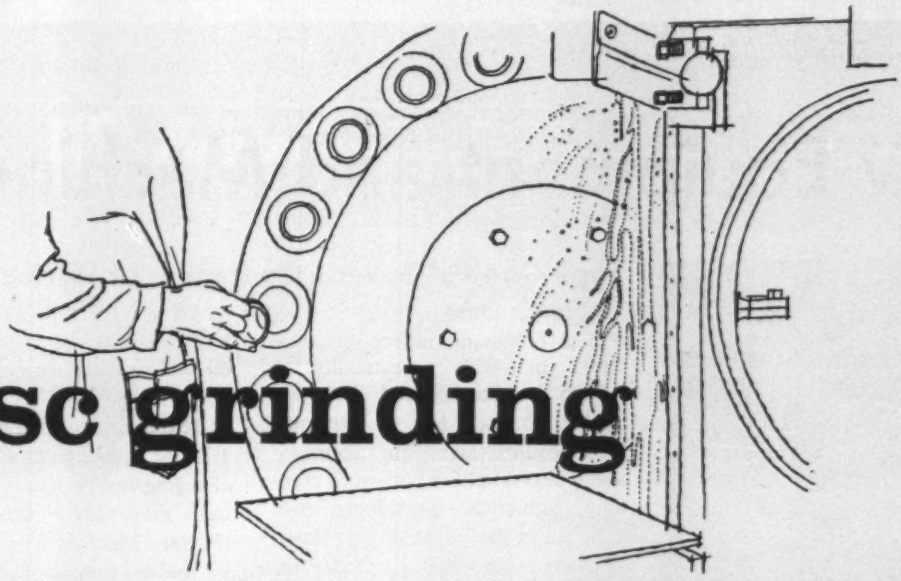
A new high in

set by

B14



New Norton Resinoid Bonded DISCS



disc grinding

Under development and testing for two years . . . now available as the finest discs of their type ever made.

At Norton, product development never ends — either as a policy of leadership or as a continuous source of new advantages to industry in every type of grinding.

The latest news-making achievement in Norton product development is the B14 resinoid bond for disc wheels.

Development of the B14 bond involved not only improvements in bond material but entirely new processing.

It took several years to perfect these changes. It also took many months to complete nationwide testing of the new B14 discs, on all types of disc grinders — horizontal or vertical spindle, single or double — on jobs ranging from snagging to precision finishing, and on ferrous, nonferrous and non-metallic materials. Also, the tests were entirely comparative — not only against competitive wheels but against Norton discs which were then standard.

Results of this across-the-board testing are outstanding. The new B14 discs have proved beyond question their ability to grind more workpieces per disc . . . faster and better, with fewer dressings . . . and with constant uniformity throughout extra long disc life.

Let new B14 discs bring *you* proof of better, lower cost surfacing. Have your Norton Man, a trained Abrasive Engineer, study your requirements and make trial runs of the B14's you need — solid discs or segmental, ALUNDUM* or CRYSTOLON* abrasive. Or get details from your Norton Distributor. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Marks Reg. U.S. Pat. Off. and Foreign Countries

A few of very many reports from Norton customers . . .
PROVING B14 DISCS THE BEST

JOB: Rough grinding iron castings, 3½" x 2½".

REPORT: **B14 37 CRYSTOLON wheel ground 6,000 parts with one dressing. Best previous disc gave 4,500 parts with 4 dressings.**

JOB: Surfacing cold rolled steel washers on double disc machine.

REPORT: **B14 19 ALUNDUM discs impressive as best so far, with very even wear.**

JOB: Through-feed grinding of 52,100 steel bearing races.

REPORT: **B14 ALUNDUM disc very free from cutting, clean and cool. Longer life than previously used Norton disc.**

JOB: Double-disc grinding Alnico magnets.

REPORT: **B14 mixed-abrasive wheel thoroughly approved for new orders.**

JOB: Double-disc grinding abrasive sticks.

REPORT: **B14 37 ALUNDUM disc gave improved rate of cut. More abrasive sticks per disc-dressing.**

JOB: Rough grinding miscellaneous parts on double end machine.

REPORT: **B14 44 ALUNDUM disc performed better, lasted longer than all types.**

NORTON
ABRASIVES

W-1991

75 years of . . . Making better products . . . to make your products better

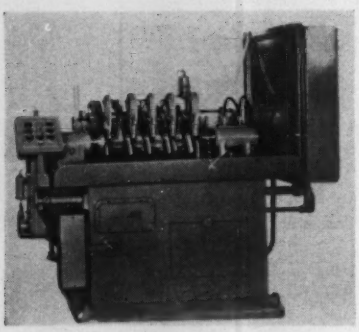
NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

New Equipment and Machinery

Tape Control Speeds Operation of Horizontal Mill

Read-out units on each axis of a new horizontal mill position to 0.001 in.—with repeatability to 0.0005 in. Control and drive are applied to each axis in sequence. This insures maximum accuracy, and it also simplifies part-work planning. Numerical - positioning input data can be dial input or tape input. Zero-set positioning is included for initial setups. Automatic programming controls the machine through all tool movements. It positions the work in three directions—as often as required. Rapid traverse rate is 100 ipm and is automatic without changing the feed-rate setting. Feed rates range from 100 to 0.2 ipm. (Portage Machine Co.)

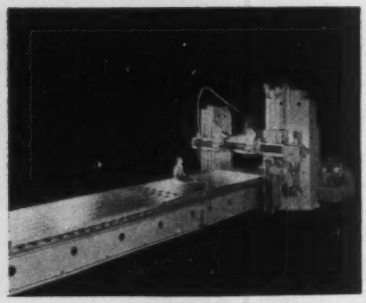
For more data circle No. 29 on postcard, p. 115



Shaft-Lapping Machines Give Good Microfinishes

Any shaft size up to 84 in. long can be lapped on a high-speed machine. Coated abrasive cloth provides a 4- to 7-microinch finish. The machine laps bearing surfaces and fillets in one operation. Jobs of this nature are impossible by honing and impractical by grinding. Abrasive cloth, in roll-form, is mounted on the lapping arms. At each cycle, the roll advances. Thus, fresh cloth is provided for each part. Lapping takes place under a flood of coolant. The coolant serves a dual role. It keeps the abrasive cloth open. It also flushes away spent abrasive. Clamping, tailstock and lapping arms are hydraulically operated. (The Foote-Burt Co.)

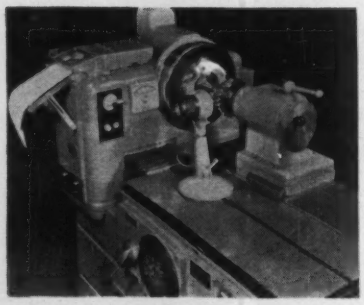
For more data circle No. 30 on postcard, p. 115



Huge Planer Has a Removable Outboard Support

Believed to be the world's longest planer, a new machine has a working surface 34 ft long. This heavy-duty planer is easy to operate. The operator controls the entire machine from a pendant. The table can be started, stopped, inched or jogged in either direction. Speed range and cutting speeds are also regulated at the pendant. The hydraulic drive contains no bearings, gears, links or joints. A one-piece L-shaped rail assures accuracy for the full life of the machine. Also featured is a removable outboard support with its own sideboard. (Rockford Machine Tool Co.)

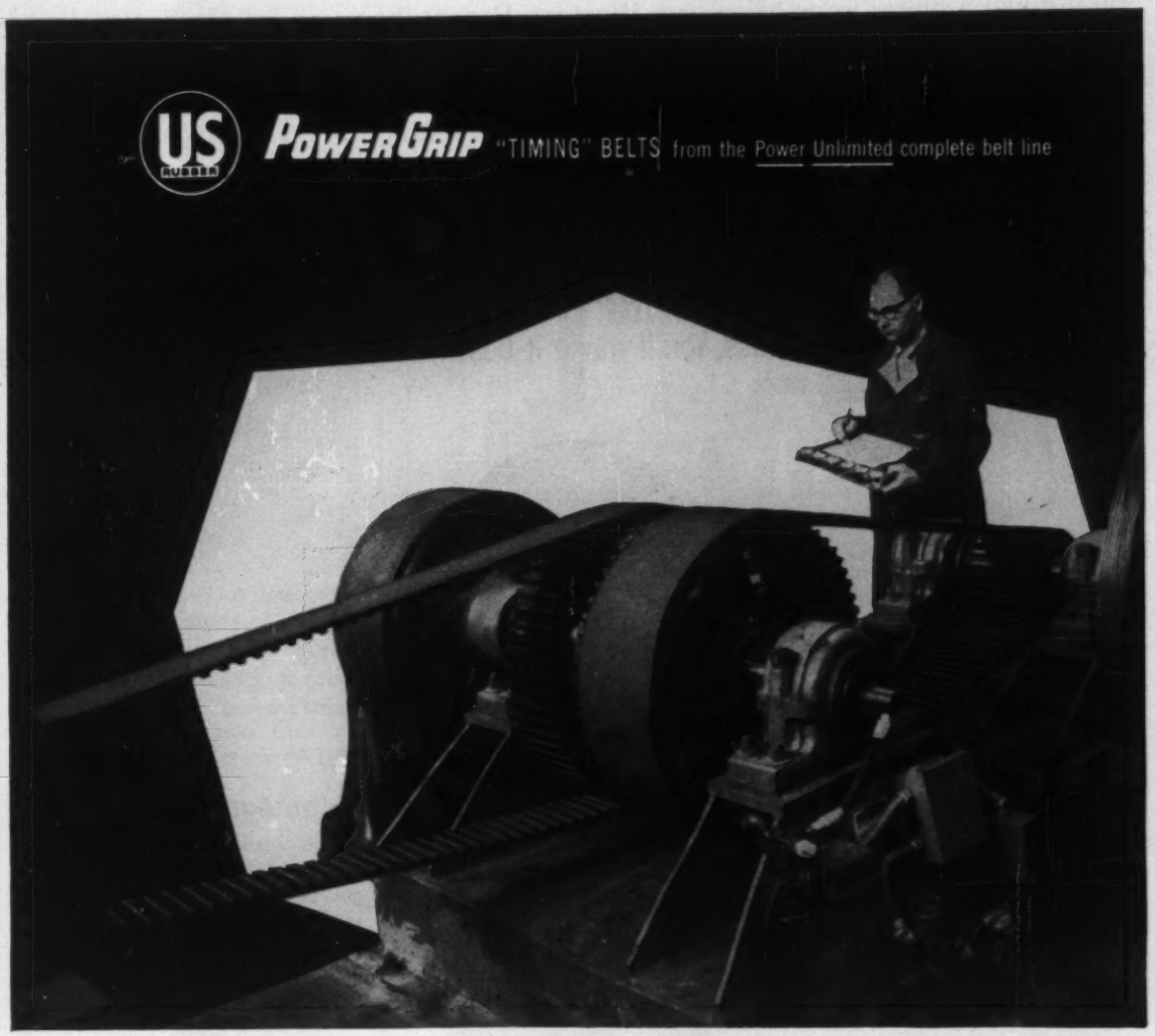
For more data circle No. 31 on postcard, p. 115



Sine-Line Lead Checker Uses Optical Indicator

A new lead checker incorporates optical instrumentation for setting both the universal sine field and an angular dividing head. This checker is independent of the operator's touch. All settings are visual. Angles can be set within 0.001° without using gage blocks. The lead checker handles conventional continuous checking or increment checking through use of a scale on the tailstock. Leads of external or internal, spur and herringbone gears, and worms can be checked from zero to infinity. Tooth spacing can also be checked with the dividing head. (Michigan Tool Co.)

For more data circle No. 32 on postcard, p. 115



Sun Oil Company obtains positive results with U.S. PowerGrip "Timing" Belts

The octane requirements for cars are determined by the Sun Oil Company with scientific accuracy. The octane ratings of motor fuels are in turn determined with precision. Nothing is left to chance. This is why the motorist can pull up at a Sunoco station and obtain the correct octane blend for his car.

All of this predetermination is done on precision equipment whose universal joint drive shaft is connected to a dynamometer by a 1¼" pitch U. S. Rubber PowerGrip "Timing"® Belt. In the words of a company scientist, these belts were selected because they give foolproof, positive drive transmission and do not require lubrication, maintenance or attention. Anything less would interfere with the precision of the testing equipment. This is the experience that has caused innumerable design engineers to specify PowerGrip.

This is the belt that has made possible the development and production of hundreds of appliances and equipment, ranging from sensitive electronic devices, office machinery, household equipment and gigantic production machinery. One way to get expert and instant power and transmission advice is from the U.S Distributor.

See Our **IDEA PLAYGROUND** ★ Booth 119 ★ **PRODUCTION ENGINEERING SHOW**

US RUBBER

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

You'll make a better impression with **Western Brass**...because, tough as it is, ductile solid brass is perfect for coining, embossing or stamping, gives you a glowing natural finish, takes gracefully to buffing or plating when required. And Western Brass—with its uncompromising attitude towards accuracy of temper, alloy, gauge and finish—produces a broad range of copper base alloys in sheet and strip that turn even the most critical of stamping procedures into routine operations. You'll make it better with solid, easy-to-stamp brass. You'll make it best with "tailor-made" Western Brass.

Olympic medals were stamped out of Western strip. For the recent Olympic Winter Games, third-place medals, all three thousand commemorative medals, and the centers of all first-place gold medals were made of Western Commercial Bronze.

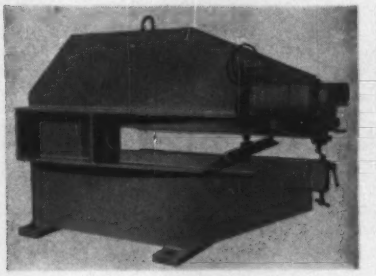
OLIN MATHIESON • METALS DIVISION • EAST ALTON, ILL., NEW HAVEN, CONN.

Western BRASS

NEW EQUIPMENT

Shearing and Forming

Shearing and forming machines are used in sheet-metal shops, schools, engineering departments, model shops and in plants where small production runs eliminate costly dies. Capacities of a new line range from 14 gage up to 7/32

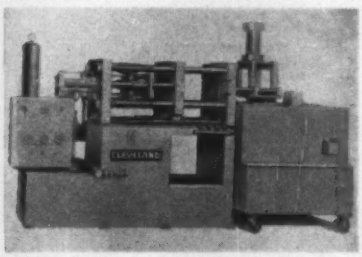


in. in mild steel. This line offers an economical method of straight, circular and irregular shearing, plus slotting, folding, beading, joggling, edge bending, and louver cutting. (The American Pullmax Co.)

For more data circle No. 33 on postcard, p. 115

Die-Casting Machine

Equipped for accumulator operation of both shot- and die-closing cylinders, an automatic die-casting machine cycles well over 1000 shots per hour, depending upon the size and complexity of castings, the metal being cast, and the method of operation. It has a shot capacity



of 2.6-lb aluminum and 4.2-lb zinc with standard plungers. The machine has 22 by 23-in. die plates. It can accommodate dies of 19-in. maximum and 4-in. minimum thickness. Platens are 3¾-in. thick and tie bars are 2½-in. diam. (The Cleveland Automatic Machine Co.)

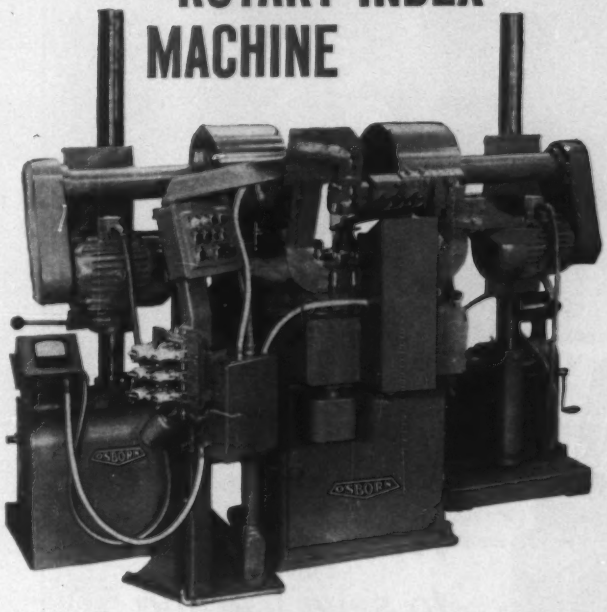
For more data circle No. 34 on postcard, p. 115

Gage Blocks

Sizes of rectangular gage blocks, 0.050 in. and larger, are etched on

to cut your metal finishing costs—

OSBORN AUTOMATIC ROTARY INDEX MACHINE



features "building block" components arranged for completely automatic finishing cycles

An automatic part load/unload and turnover mechanism is the latest addition to Osborn's Rotary Index metal finishing units. This feature eliminates the need for production machine operators—and means regulated work flow plus higher production rates.

Most significant feature is the use of a *standard* index table and *standard* finishing heads easily tailored for efficient, economical *automated finishing* operations.

Other advanced design and construction features make these Osborn Metal Finishing Machines worth your immediate investigation.

Your Osborn field specialist has latest application data on a wide range of cost-saving finishing methods. An Osborn Analysis—made in your plant now at no cost or obligation—is the first step to pinpoint savings in *your* operations. Write or call *The Osborn Manufacturing Company, Dept. F-100, Cleveland 14, Ohio. Phone ENdicott 1-1900.*

PRODUCTION ENGINEERING SHOW

OSBORN BOOTH 375-377

OSBORN

Metal Finishing Machines . . . and Finishing Methods
Power, Paint and Maintenance Brushes • Foundry Production Machinery

THE TRS MAN TOOK AN INSIDE LOOK

to save Carling 50% on a toggle-switch part

Carling Electric already used two TRS rivets to assemble snap-acting toggle switches, had no fastening problems for that product. But a stamped brass cap, in the top of each switch spring, kept costs up . . . springs had to be ground flat to seat the cap securely, and costs of brass strip stock, parts inventory, and tool maintenance were high.

Trained in the PAR Process approach to cost reduction, the TRS man saw a way out . . . suggested a dimpled *rivet* in place of the cap, worked out details with Carling engineers. This simple change eliminated spring grinding, stamping tool maintenance, brass strip stock and finished caps inventory. The dimpled rivets improved reliability and smoothness of toggle action, and dependable TRS deliveries removed any need for stocking them ahead of demand. Result: Carling scrapped existing parts inventory, converted to the new design at once.

FIND OUT what the Par Process can save you

The PAR Process aims at lower costs and higher production rates. It starts with a sharp-eyed, production line search by your TRS man, for ways to eliminate or simplify and speed up steps in the assembly — using procedures specially organized by TRS, benefiting from unique TRS developments in rivets and riveting machines.

PAR may bring you better integration and fuller automation of assembly operations, or even a cost-cutting change in design as with Carling. Ask for a check of your operations. Whether your assembly jobs are simple or complex, it can be worth dollars to you.

THE CHANGE THE TRS MAN SUGGESTED

▼ **OLD** stamped cap transmits toggle motion through spring to moveable contact. Requires flat-ground spring to prevent slips and jamming, adds extra costs of strip stock, parts inventory, stamping tool maintenance.

NEW ▶ dimpled rivet does same job better, with precision bearing surface. Sits straight and secure in unground spring, eliminates tool maintenance, removes need for costly in-plant inventories.

Don't Buy Riveting Machines until you learn how the TRS **PAR** *process revolutionizes riveting*

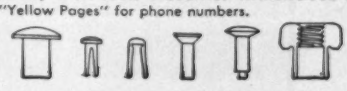
TRS®

TUBULAR RIVET & STUD COMPANY

QUINCY 70, MASSACHUSETTS • TRS SALES OFFICES: Atlanta • Buffalo • Charlotte • Chicago Cleveland • Dallas • Detroit • Hartford • Indianapolis • Los Angeles • New York Philadelphia • Pittsfield • Quincy • St. Louis • Seattle. WAREHOUSE IN CHICAGO

See "Yellow Pages" for phone numbers.

If it's a Tubular Rivet TRS makes it . . . and Better



Steel fabricators...

SLASH PRODUCTION COSTS INCREASE OUTPUT WITH BOULTON & PAUL FABRICATING MACHINES

MORE STEEL fabricators are turning to Boulton & Paul equipment for utmost economy in Sawing and Drilling. Cuts manpower from 27 men to 4 machine operators. See Iron Age 6th August 1959.

These composite sawing and drilling machines are made in a variety of sizes and plants are custom-built to suit individual requirements.

If you haven't yet had your copy of "Steelwork by Automation" write to us for addresses of agents in the U.S.A. and elsewhere.

DESIGNED AND BUILT BY FABRICATORS FOR FABRICATORS!

Our Customers include:

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Mississippi Valley Structural Steel Company
Yuba Erectors, Division of Yuba Consolidated Industries Inc.
Dominion Bridge Company Limited
Banister, Walton & Company Limited
Edward Wood & Company Limited
Matthew T. Shaw & Company Limited
P. & W. MacLellan Limited
Moreland, Hayne & Company Limited
Shelton Iron & Steel Limited
A. J. Main Limited
T. C. Jones Limited

BOULTON AND PAUL

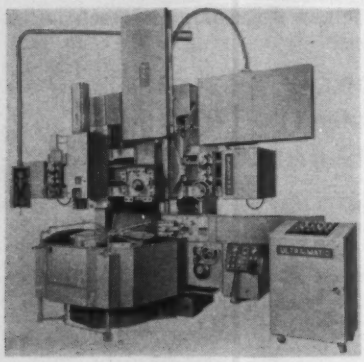
Boulton & Paul Limited STRUCTURAL ENGINEERS NORWICH ENGLAND

the side and clearly visible while stacked. This improvement applies to both the standard type and the new stainless steel blocks. No longer is it necessary to disassemble a stacked combination in order to recheck the block sizes. Individual block dimensions can be seen at all times and the total dimension of the combination is easily determined. (The DoAll Co.)

For more data circle No. 35 on postcard, p. 115

Vertical Boring Mill

A vertical boring and turning machine features a programming device which provides complete automatic control of a full cycle of machining operations. The ram head on this machine has an electronic tracer, providing two-dimensional 360° tracing operation. The machine has constant chip-thickness control interlocked with the constant surface cutting control of



the table. Thus, the movement of tool slide across work piece maintains constant surface cutting, and also the preset feed rate for all changes of the table. (American Steel Foundries)

For more data circle No. 36 on postcard, p. 115

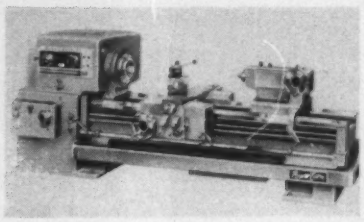
Spring Wire

Isoloy spring wire has been made available in three popular types of stainless steel. The extremely uniform spring wire is now produced in Types 302, 304 and 316. (Riverside-Alloy Metal Div., H. K. Porter Co., Inc.)

For more data circle No. 37 on postcard, p. 115

Hollow-Spindle Lathe

Designed for oil-field work, a hollow-spindle lathe is now widely used in many industries where long

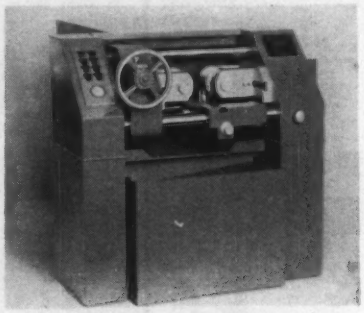


workpieces are found. The hole through the spindle allows chucking of workpieces which are longer than the normal 120-in. center distance. Between-center work can also be performed. The demonstration operation will include taper threading and other typical hollow-spindle applications. (Lodge & Shipley Co.)

For more data circle No. 38 on postcard, p. 115

Cylindrical-Die Units

Two cylindrical-die models have been designed for the plant operator who needs a machine for both in-feeding of large diameter work and a machine that can produce at high speeds on parts 1-in. OD and under. The machine can be purchased as an in-feed machine only.



By purchasing the correct dies and feeding mechanism it can be used as a high-speed threading machine. (Reed Rolled Thread Die Co.)

For more data circle No. 39 on postcard, p. 115

Rubber-to-Metal Bonds

A new adhesive system for bonding rubber to metal cures at room temperatures. Based on a polyurethane formulation, the new material forms a tough, yet flexible bond. Since no heat or pressure is re-

quired, the adhesive is ideal for such uses as attaching rubber feet to metal instrument cases, or installing flexible seals on cabinet doors. (Plastic Associates)

For more data circle No. 40 on postcard, p. 115

Free Catalogue!

Stainless Steel & Nonferrous Fasteners!

- 30,000 different sizes, types, styles.
- Fifty million fasteners in inventory. Same-day shipment out of stock. Special service on specials.
- Write Albany Products Co. Inc. 351 Connecticut Ave., South Norwalk, Conn. Ask for Product List J.

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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Hack-Saw Blades

All types of hand hack-saw blades are described in a catalog. Data includes blade size, teeth per inch, type of alloy and recommended uses. (G. W. Griffin Co.)

For free copy circle No. 1 on postcard

Sintered Nylon Parts

Nylon wear components, formed by cold pressing and sintering nylon powders, are presented in a bulletin. The four-page bulletin lists the formulations available. Application stories on the use of the parts for bearings, rollers, cams, and general wear parts are included. (Halex Corp.)

For free copy circle No. 2 on postcard

Tooling Materials

Detailed information on the use of ceramic tooling materials at elevated temperatures is contained in a bulletin. (Duramic Products, Inc.)

For free copy circle No. 3 on postcard

Scales

Heavy-duty portable, dormant, lift-truck, and overhead track scales, and scales for packing, counting and mailing operations, are described in a brochure. In addition, it illustrates and describes automated weighing equipment. (Detecto Scales, Inc.)

For free copy circle No. 4 on postcard

High-Strength Metals

A price book provides base prices and extras for high-temperature and high-strength metals. Also, included is a breakdown of prices for grades produced by the company's vacuum melting processes. (Universal-Cyclops Steel Corp.)

For free copy circle No. 5 on postcard

Press Brakes

A revised catalog on mechanical press brakes covers latest features and new models added to the line. The table on specifications has been greatly enlarged and covers machines from 160-1250 tons, midstroke capacity. (The Cleveland Crane & Engineering Co.)

For free copy circle No. 6 on postcard

Wheel Dressers

Tangential angle wheel dressers and parts are shown in a catalog. Included in the catalog are: surface grinder dressers; hand-type dressers in both light and heavy duty; and all replacement parts. (L. Newman.)

For free copy circle No. 7 on postcard

Compressed Gas

Prices and data on 85 compressed gases, gas mixtures, and a complete line of gas regulating and handling equipment, are included in a catalog. (The Matheson Co., Inc.)

For free copy circle No. 8 on postcard

Transit Tests

The National Safe Transit Committee's tests and their application to corrugated shipping containers are covered in a four-page brochure. This brochure describes the tests and briefly outlines advantages to shippers. (Gaylord Container Corp.)

For free copy circle No. 9 on postcard

Palletless Handlers

What palletless handling is, where it fits, and the advantages of palletless handling are discussed in an eight-page brochure. Materials-handling engineers can refer to five pages of action photographs for ideas on how similar

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **8/25/60**

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FREE LITERATURE

companies in their industry are handling their products. (Automatic Transportation Co.)
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Capacitors

Low-voltage and high-voltage power-factor capacitors are covered in a bulletin. They are used by industry to correct power-factor deficiencies in plants. (Federal Pacific Electric Co.)
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Heat-Treating Furnaces

A 12-page bulletin describes and illustrates electrically-heated and fuel-fired continuous chain belt conveyor furnaces. The furnaces are for clean and scale-free hardening, non-decarb hardening, carbon restoration, carburizing, carbonitriding. (The Electric Furnace Co.)
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Magnetic Gages

Magnetic gages for liquid level are covered in detail in a six-page catalog. The features, models, construction data and how the gages operate are included in the catalog. (Jerguson Gage & Valve Co.)
For free copy circle No. 13 on postcard

Materials Selection

Materials-selection data is the subject of a four-page flyer. It lists suggested construction materials for metering pumps handling various chemicals. (Clark-Cooper Co., Inc.)
For free copy circle No. 14 on postcard

Bonding Mortar

Of interest to iron and steel engineers, purchasing agents and maintenance personnel, a bulletin describes a bonding mortar. Also included are special sections on eight general advantages of the product and "user reports." Complete technical data is included. (J. H. France Refractories Co.)
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Weighing Attachment

A catalog illustrates and describes a weighing attachment for fork trucks. The electronic weighing attachment makes possible the in-transit weighing of loads by fork trucks. The attachment eliminates the need for weighing loads at platform scales. The four-page catalog explains the design and step-by-step operation of the weighing attachment. (Clark Equipment Co.)
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Fluorocarbon Shapes

Fluorocarbon stock shapes and fabricated parts are described in an eight-page bulletin. Complete physical-property tables and representative applications for rod, tubing, tape and sheet are included. (The Polymer Corp. of Penna.)
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Controls Machine

Containing some general information on numerically-controlled machine tools, a 12-page booklet describes three specific types of machines in use today. The booklet contains many photographs. (Ex-Cell-O Corp.)
For free copy circle No. 18 on postcard

Spindle Repair

A bulletin describes and illustrates the company's extensive facilities for prompt repair; also its renewal of all makes and sizes of belt-driven, motorized and high-cycle spindles for grinding, boring, drilling and milling operations. (Pope Machinery Corp.)
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Surface Grinder

An 8 x 24-in. hydraulic surface grinder is described in a bulletin. The most outstanding feature of the grinder is the additional capacity under the wheel at no extra cost. (Covel Mfg. Co.)
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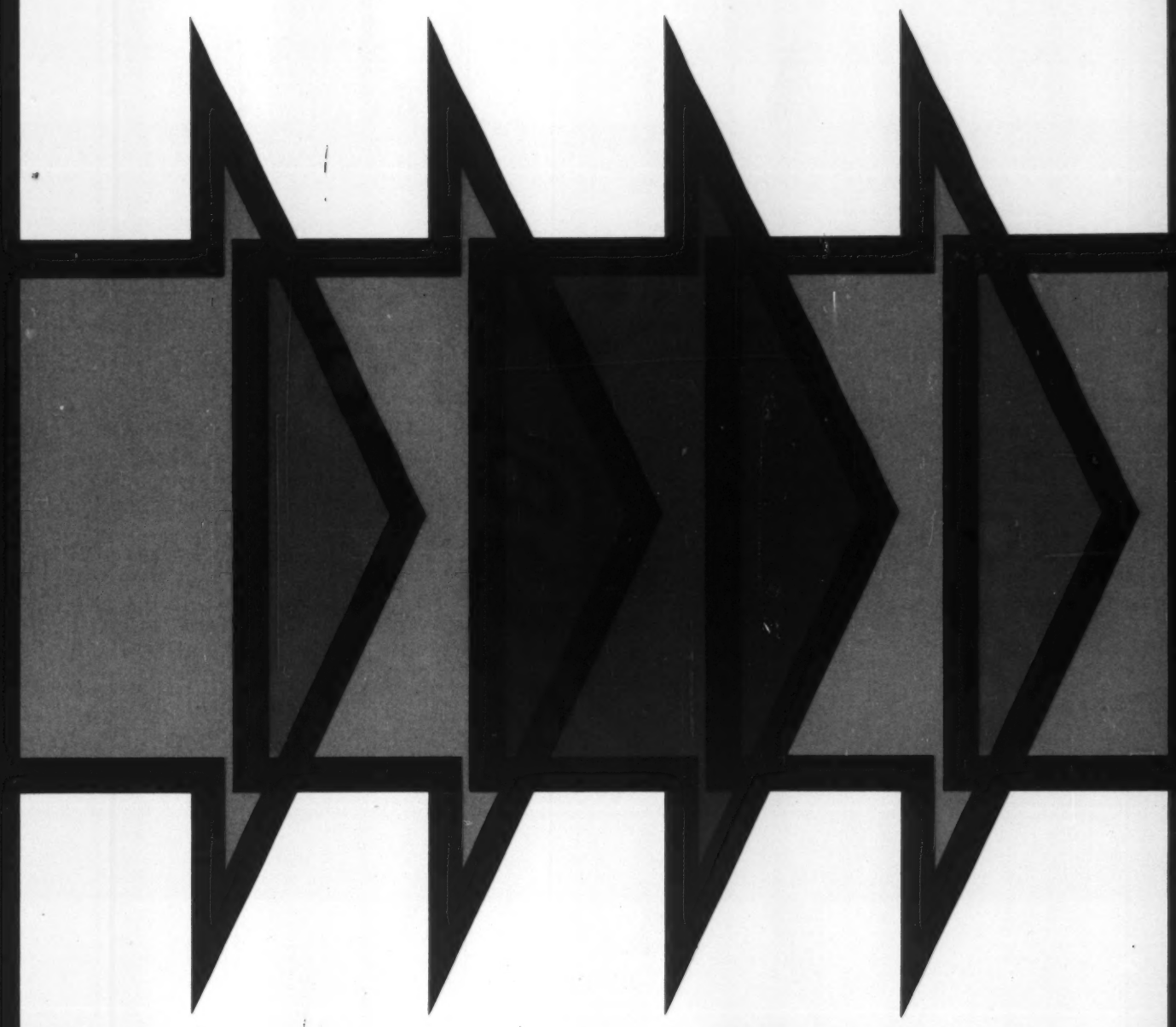
Non-Shrink Grouting

Shrinkage is the principal cause of grout failure. Explaining how to avoid this shrinkage, through the use of properly-applied non-shrink grout, is the subject of a 16-page bulletin. (The Master Builders Co.)
For free copy circle No. 21 on postcard

Plant Safety Hazards

A list of the 15 principal plant safety hazards informs readers of the sort of thing that uniformed guards should be on the lookout for. Also included in the literature is a list of nine pointers to help keep the after-hours guard out of trouble. (Pinkerton's National Detective Agency, Inc.)
For free copy circle No. 22 on postcard



FROM GREAT LAKES STEEL

15 X-A-R 30

ABRASION RESISTANT STEELS

TWO NEW STEELS—HARDER FOR HARDER JOBS

X-A-R

ABRASION RESISTANT STEELS

HARD ENOUGH AND TOUGH ENOUGH TO LAST

Is abrasion your constant enemy? If your equipment meets materials as they're scooped, shoved, slid, pushed, dragged or dumped, does it face the recurring threat of downtime for repairs or replacement? To eliminate such maintenance headaches, Great Lakes Steel has developed two tougher, harder alloy steels—X-A-R 15 and X-A-R 30. They're supplied in hardnesses from 360 to 400 BHN (or, by agreement, in a range of hardness between 265 and 500 Brinell). And they're especially effective and economical in those critical bear-the-brunt areas of the equipment where wear is worst—liners, teeth, bars, blades and plates, for example. *Under conditions that commonly wear out equipment in a hurry, X-A-R abrasion-resistant steels outwear any other type of steel.*

Great Lakes Steel is a division of

WHERE MATERIALS COLLIDE WITH EQUIPMENT

Chemical composition alone is not the secret of low carbon X-A-R steels; their balanced combination of uniformity, high strength, hardness and toughness is the result of close control during heat-treating, quenching and tempering. This makes them more workable, too. Under normal welding and fabricating conditions use X-A-R 30. For *extremely* difficult problems, such as welding under cold conditions or extensive flame cutting, choose X-A-R 15.

X-A-R abrasion resistant steels are immediately available in ⅛″ to 1″ thicknesses, widths up to 72″ and lengths up to 35′. For technical information and supply sources, see next page.

X-A-R

A PRODUCT OF

GREAT LAKES STEEL

Detroit 29, Michigan

NATIONAL STEEL CORPORATION

15 X-A-R 30

TECHNICAL INFORMATION

CHEMICAL COMPOSITION

X-A-R steels are furnished at two specified carbon ranges. These are 14 to 20 carbon for X-A-R 15 and 25 to 30 carbon for X-A-R 30. The balance of the typical composition is:

Manganese	.80%	Chromium	.65
Phosphorous	.020	Molybdenum	.20
Sulphur	.028	Zirconium	.06
Silicon	.60		

TYPICAL MECHANICAL PROPERTIES

	At Brinell Hardnesses of: 363	400
Tensile Strength, psi	180,000	200,000
Yield Strength, psi	165,000	180,000
% Elongation in 2"*	17	16
% Reduction in Area*	56	55
Charpy V Impact at —75°F.	12 (Ft. Lbs.)	7

*Based on standard .505" specimen

ENGINEERING DATA

Resistance to Atmospheric Corrosion (Rural, Marine, and Industrial Environments)	3-5 times copper-bearing or carbon constructional steel
Compressive Yield Strength, psi	Approx. equal to Tensile Yield Strength
Ultimate Shearing Strength, psi	Approx. equal to Tensile Yield Strength
Modulus of Elasticity, psi	29/30,000,000
Endurance Limit (rotating beam)	60% of Tensile Strength
Coefficient of Expansion per °F.	70°F. to 200°F.—.0000062

FABRICATION

Cold Bend Test: Moderate bending can be performed within the usual range of hardnesses. For free bending, it is recommended that a mandrel be used not less than ten times the thickness of the metal through an angle of 90°.

Welding: Low hydrogen electrodes are recommended for welding X-A-R steels. The grade of electrcde used is dependent on the strength requirement of the weldment.

Burning: X-A-R steels can be flame cut without pre-heating or stress relieving after cutting.

COMPLETE METALLURGICAL SERVICE

In addition to the information given in this folder, there is a great deal of detailed data available to steel users covering all characteristics of X-A-R steels. Furthermore, a thoroughly competent metallurgical service organization is available to work with you on any application problem you may have.

X-A-R STEELS ARE AVAILABLE AT THESE STEEL SERVICE CENTERS

BENEDICT-MILLER
Lyndhurst, New Jersey

JOSEPH DEMSEY COMPANY
Cleveland, Ohio

DUCOMMUN METALS & SUPPLY COMPANY
Los Angeles, California

INTERSTATE STEEL COMPANY
Evanston, Illinois

LOCKHART IRON & STEEL COMPANY
Pittsburgh, Pennsylvania

MARSH STEEL & ALUMINUM COMPANY
Kansas City, Missouri

O'NEAL STEEL, INCORPORATED
Birmingham, Alabama

SALT LAKE HARDWARE COMPANY
Salt Lake City, Utah

A. C. LESLIE & COMPANY, LIMITED
Montreal, Canada

15 X-A-R 30
ABRASION RESISTANT STEELS

New Patents In Metalworking

Disk Mill

Mill for rolling disks, F. P. Sharpe (assigned to Kelsey-Hayes Co., a corp. of Del.), June 28, 1960. Design for a rolling mill particularly adapted for rolling work pieces of the disk type. The operation is performed in an efficient and economical manner. No. 2,942,-504.

Little Scrap

Method of making corrosion-resistant clad steel plate, R. S. Rote (assigned to Lukens Steel Co., Coatesville, Pa.) July 5, 1960. Method of producing two-ply or clad steel plate whereby less machining and rolling are required. The amount of end scrap resulting from trimming is reduced. No. 2,-943,388.

High-Iron Concentrates

Method of beneficiating, reducing and briquetting iron ore, G. H. Halvorson (assigned to U. S. Steel Corp., Pittsburgh), July 12, 1960. Process for production of high-iron concentrates from low-grade ores, such as non-magnetic taconite. The final product contains iron in a fully reduced form, suitable for replacing scrap in steelmaking furnaces. No. 2,944,884.

Welds Circular Pipe

Process of circumferentially welding steel pipe, L. K. Dawson (assigned to Lukens Steel Co., Coatesville, Pa.), July 5, 1960. Method of circumferentially welding steel pipe sections together with a strong butt weld. The welding operation is performed entirely from the outside of the pipe. No. 2,943,387.

CAPACITY FOR FAST DELIVERY ON CUSTOM REQUIREMENTS

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LARGE INDUSTRIAL GEARS and SPEED REDUCERS

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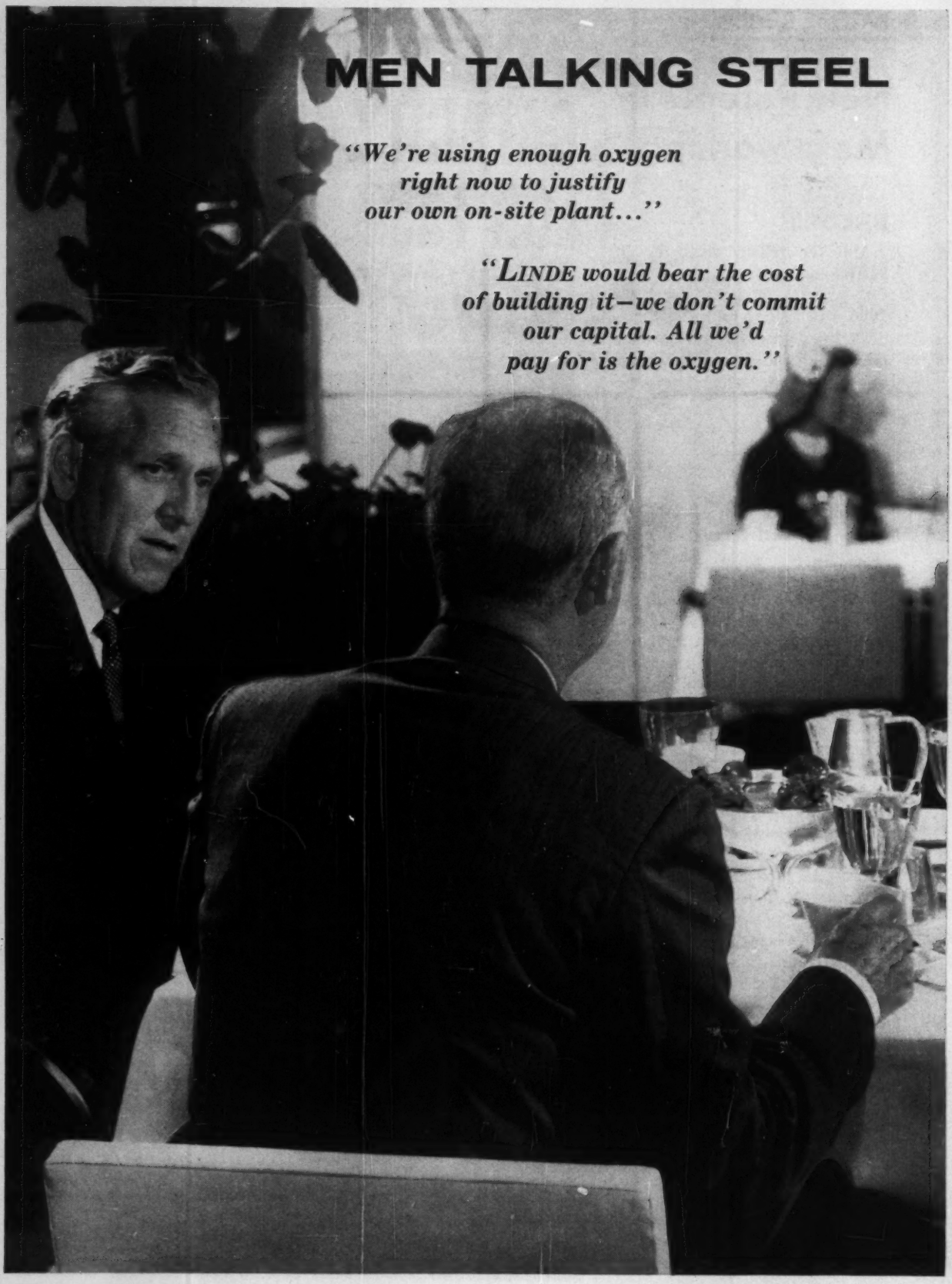
MEN TALKING STEEL
"We're using enough oxygen right now to justify our own on-site plant..."
"LINDE would bear the cost of building it—we don't commit our capital. All we'd pay for is the oxygen."

ARE TALKING LINDE OXYGEN

"With several times the back-up capacity of anyone else, LINDE can always meet emergency calls too."

"More reasonable than I expected."

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LINDE COMPANY

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Office Furniture Goes Modular

High cost of office space and need for flexibility turns buyer interests to modular units.

Care is needed in selection of units. Sometimes it still pays to buy standard units.

■ Buyer preferences in office furniture show a trend to modular units. They like the flexibility and versatility of these units.

And buyers are looking for strength in desks used for office machines. Machine suspension strength has become an important consideration as more machines are used, and used harder.

Ease of maintenance is another important consideration in buying office furniture. Manufacturers report, for example, buyer interest in easy-to-clean laminates for desk tops.

Styling and color play a big role in buyer preference in office furniture. Most design improvements in desks have been in the direction of lightness with more strength. Chairs are carrying more of the color variety in styling.

Space Cost—There are practical considerations behind buyer preferences in office furniture. One consideration is the high cost of space.

According to the National Building Owners and Managers Assn., the latest available (1958) national average annual cost of office space is $2.80 per sq ft. This figure covers only "rentable," or directly usable area. Like all other costs, it has risen steadily.

Largely because of this cost, companies have tried to squeeze office operations into minimum areas. The present open area type of building construction reflects this effort.

Modular units are a "natural" in these newer floor arrangements. They adapt easily and quickly, saving space.

Select With Care—Experienced buyers of office furniture join with leading manufacturers in saying that modular units must be selected with care. Sometimes flexibility claims backfire. The time involved in making unit changes in modular items can be longer than that of a mere shifting of standard units. While items may have complete flexibility it still may take two or three first class mechanics to make the changes.

W. E. Hilbert, administrator, commodity research, in the purchasing department at RCA, is one who cautions buyers to take a hard look at modular furniture. Says Mr. Hilbert; "We change too much —in size and types of groups—to find an advantage in modular furniture."

People and Equipment—Mr. Hilbert sees modular units as useful where worker groups perform the same or related tasks. When actual jobs vary then different desks and files should be used.

Another reason big office-furniture-buyer RCA likes standard units is that they determine annual purchase needs in office furniture and negotiate with one or two manufacturers in getting a price. Standard units are more adaptable to this practice.

Maintenance Ease — Durability and ease of maintenance are factors behind the swing from wood to metal office furniture. The U. S. Bureau of Standards places the life span of wood office desks at 10 years, metal ones at 15 years. The government uses these life-span figures in planning and buying for its own vast office furniture needs.

MODERN OFFICE: Modular unit (rear) is both desk and conference table. Files add color. Desk bases facilitate ease of floor maintenance.

The Iron Age Summary

Price Hikes Unlikely This Year

Market conditions now just will not support a price increase, most steel officials believe.

Only an unexpected uptrend in steel orders could change present thinking on price policies.

■ The chances of a rise in steel prices late this year are growing slimmer and slimmer.

Unless there is a drastic change in the market, and a resulting change in policy-level thinking, there will be no increase in steel prices.

If the market changes, there could be a rise in prices next spring. But, more probably, there will not be a general change in the steel price structure until later in 1961.

The Factors—These factors are combining against price changes:

1. The current demand for steel is far off expectations and the market will not support an increase. The outlook for September and October, when a major upturn had been expected, is now comparatively pessimistic.

2. Large consumers, such as automotive and canmakers, are throwing their weight against price increases. Because of the current market conditions, and the increasing application of other materials (see below) they are able to make their weight felt to a greater extent than has been the case for years.

3. It is all the steel industry can do to hold the line at present levels, much less raise prices. Only knowledge that any move could wreck the entire price structure is preventing one-shot deals.

In addition, the industry long ago became convinced that lower prices do not necessarily mean more steel orders.

4. The threat of imports and inroads of other materials is strong. This is evidenced in significant inroads of aluminum into canmaking and automotive applications this year.

The Outlook—On general market conditions. September is now shaping up at a disappointing 5 pct improvement over August. Recent orders in the past 10 days have shown a moderate improvement.

Failure of major consumers, automotive in particular, to step orders up sharply, adds weight to suspicions that many users have not depleted their inventories.

In fact, some have been borrowing from September tonnage in their July and August orders. This means the September and October upturn will be less than expected.

Strike Effort — The railroad strike which idled much of U. S. Steel's capacity contributed to this thinking. For example, a major automotive stamper anticipated no problems. This is in spite of the fact that full production on new models is due this week.

This indicates automakers have been buying all along in advance of requirements.

In contrast, the threat of the strike brought immediate panic among companies short on inventory and many purchasing agents immediately started lining up alternate sources.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,552	1,558	1,520	332
Ingot Index				
(1947-1949=100)	96.6	97.0	94.6	20.7
Operating Rates				
North East Coast	59.0	62.0*	61.0	12.0†
Buffalo	57.0	59.0*	56.0	0.0†
Pittsburgh	46.0	47.0*	49.0	24.0†
Youngstown	44.0	45.0	48.0	10.0†
Cleveland	50.0	51.0*	32.0	0.0†
Detroit	79.0	77.0*	80.0	23.0†
Chicago	59.0	58.0*	56.0	5.0†
Cincinnati	58.0	55.0*	48.0	61.0†
St. Louis	66.0	68.0*	41.0	79.0†
South	60.0	59.0*	62.0	12.0†
West	53.0	49.0*	51.0	0.0†
U. S. Rate	54.5	54.7	53.3	11.7

*Revised †IRON AGE Estimates
Source: American Iron and Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$32.50	$32.50	$31.50	$40.17
No. 2 bundles	$22.17	$22.17	$21.17	$27.67
Nonferrous				
Aluminum ingot	26.00	26.00	28.10	26.80
Copper, electrolytic	33.00	33.00	33.00	30.00
Lead, St. Louis	11.80	11.80	11.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	101.625	101.875*	104.375	103.00
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

Customers Place Minimum Orders

A fall order upturn isn't being rushed along by steel users.

They are buying as little as possible as seldom as possible. Consequently, mills haven't extended delivery promises.

■ Failure of the September upturn to materialize has left mills scrambling for orders. Their big weapon continues to be the promise of fast delivery.

In the past month only one market, Chicago, has shown any tendency toward longer lead times. And even there the changes have been slight—about one week. However, district mills had offered the shortest lead time.

While the changes bring Chicago delivery promises closer to the average (see table below), they are still below several districts. In Detroit, for example, cold-rolled sheet and strip delivery promises shortened by a week but are still one week longer than in Chicago.

East Coast steelmakers note that inventory cutting isn't over. In some cases, customers are reported placing only enough tonnage in each order to take advantage of item quantity and order quantity discounts. For example, instead of ordering six items of 10 tons each, they'll order only two items of 10 tons each.

Sheet and Strip — Automotive buying is the only strength in the flat-rolled market—and the strength is only relative. **East Coast** mills are loaded with hot bands so they can handle rush orders in less than standard time. **Pittsburgh** sheet mills report a slight increase in order volume, but the strike at U. S. Steel isn't expected to create any shortages. Incoming order rate for **Cleveland** indicates a 5 pct increase in flat-rolled shipments in September compared with August.

The stretchout in lead times noted in **Chicago** is, for the most part, due to the fact some producers are in the process of renovating finishing mills. Only secondarily is it the result of increased orders.

In **Detroit,** October automotive orders are starting to come in. Orders from two major units came in last week to one company, including "a nice order of hot-rolled sheets" from Fisher Body.

Plate and Structurals — A slow market continues on the East Coast with little improvement expected. There's little doubt that users are holding inventories as close as possible, however. Plate users supplied by U. S. Steel's strike-bound plants around Pittsburgh are already "nervous" about future supplies. One says a one-week shutdown would create spot shortages and hamper its September operations. Another indicates it would have to shift tonnage to other suppliers after only two or three days.

Stainless—A sharp boost in stainless operations is expected when strip orders come in from automotive suppliers, according to reports from **Pittsburgh.** Since April, producers have had to rely on support from general users.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	2–5 wks	2–4 wks	3–5 wks	3–5 wks	2–4 wks	4–5 wks
HR Carbon Sheet	2–4 wks	2–4 wks	2–4 wks	2–4 wks	2–4 wks	4 wks
CR Carbon Strip	2–5 wks	3–5 wks	3–5 wks	3–5 wks	3–4 wks	4–5 wks
HR Carbon Strip	2–4 wks	2–4 wks	2–4 wks	2–4 wks	2–4 wks	4 wks
HR Carbon Bars	2–4 wks	1–3 wks	2–4 wks	1–4 wks	Stock–2 wks	4 wks
CF Carbon Bars	2–4 wks	1–3 wks	2–3 wks	Stock–8 wks	Stock–4 wks	1–2 wks
Heavy Plate	2–3 wks	1–2 wks			2–3 wks	4 wks
Light Plate	2–3 wks	1–2 wks	2–4 wks		1–3 wks	4 wks
Merchant Wire	Stock	Stock	1–3 wks		Stock	2 wks
Oil Country Goods	Stock	Stock	Stock		Stock	
Linepipe	Stock	1–4 wks	Stock		4–8 wks	4–8 wks
Buttweld Pipe	Stock	Stock	2–4 wks	Stock	Stock–2 wks	Stock
Std. Structurals	2–4 wks	1–2 wks	3–5 wks	1–4 wks	1–3 wks	2–4 wks
CR Stainless Sheet	Stock–4 wks	Stock–3 wks	Stock–6 wks	1–4 wks		
CR Stainless Strip	Stock–4 wks	Stock–3 wks	Stock–6 wks	1–4 wks		

Baltimore Expansion Planned by Armco

Armco Steel Corp. will spend $1.8 million to expand steel processing and warehousing facilities at its Baltimore Works, C. G. Davies, vice president and general manager, Armco Div., said yesterday.

Mr. Davies described the expansion program as the most recent step in Armco's long-range plan to keep its facilities ahead of competition in the rapidly growing specialty steel industry. A new 48,500 sq ft building will be erected to house bar processing equipment and provide warehouse space.

"This expansion will increase our bar shipping capacity by 50 pct," C. C. McElvain, Baltimore works manager, explained. "This means we will have the capability to ship 3000 tons of stainless bar a month."

COMPARISON OF PRICES

(Effective August 23, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Aug. 23 1960	Aug. 16 1960	July 26 1960	Aug. 25 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Aug. 23 1960	Aug. 16 1960	July 26 1960	Aug. 25 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$31.50	$31.50	$30.50	$43.50
No. 1 steel, Phila. area	34.50	34.50	33.50	39.50
No. 1 steel, Chicago	31.50	31.50	30.50	37.50
No. 1 bundles, Detroit	29.50	29.50	27.50	36.50
Low phos., Youngstown	37.50*	37.00	34.50	45.50
No. 1 mach'y cast, Pittsburgh	47.50	47.50	48.50	52.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	50.50
No. 1 mach'y cast, Chicago	47.00	47.00	45.50	60.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$32.50	$32.50	$31.50	$40.17
No. 2 bundles	22.17	22.17	21.17	27.67
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50 15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	30.00
Copper, Lake, Conn.	33.00	33.00	33.00	30.00
Tin, Straits, N. Y.	101.625†	101.875**	104.375	103.00
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	12.80
Aluminum, ingot	26.00	26.00	28.10	26.80
Nickle, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

TOO BUSY

to give up a few hours a year for a health checkup?

Your best cancer insurance is a thorough checkup every year, and alertness to Cancer's 7 Danger Signals.

Learn how to guard yourself against cancer. Write to "Cancer" in care of your local post office, or call your nearest office of...

American Cancer Society

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*Appears in the Aug. 18-Sept. 1 issue

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

Missile's "Fast Draw" Starts

Cold-drawn Seamless Cuts Clean-up Costs For Anker-Holth's Power Cylinders

The Missile Age version of the "fast draw" starts with the lightning stroke of a power cylinder.

Big, 12-foot stroke hydraulic cylinders provide the power and speed that unsheath one of the nation's principal defense missiles for instantaneous action.

They're made by Anker-Holth Division of The Wellman Engineering Company from Pittsburgh Steel Company's commercial quality, carbon steel, Seamless Mechanical Tubing.

Mounted two to a unit, the husky cylinders must—within seconds, and without fail—slide back the two halves of the hangar-size missile shelter to release the weapon for firing.

Anker-Holth, of Port Huron, Mich., uses Pittsburgh Steel's Seamless Mechanical Tubing to manufacture this critical unit's outer cylinder and piston rod.

Relies on Pittsburgh—What makes this company rely on Pittsburgh Steel for the tubing it requires for this application?

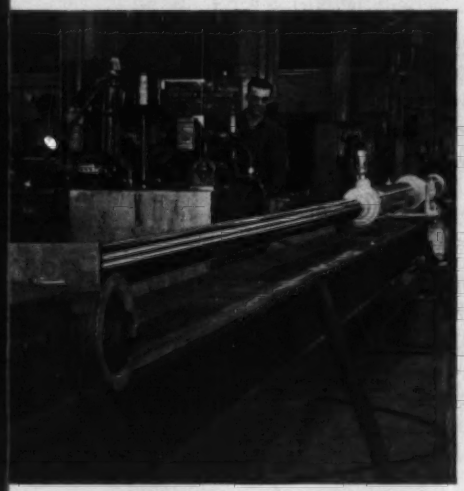
Fred J. Theisen, vice president-production, says there are several reasons. He explains:

"First is Pittsburgh Steel's service. They're able to give us information fast.

"On the first lot of tubing for this job, we asked all our suppliers for recommended sizes for cleanup to our finished dimensions. Pittsburgh

Piston rod made by Anker-Holth for launcher shelter's roof activating cylinder requires only minimum processing for cleanup with commercial quality Pittsburgh Steel Seamless Mechanical Tubing. Finished rods, 142" long, are plated with hard chrome. Vice president-Production Fred J. Theisen, (left) talking with Pittsburgh Steel salesman T. J. Whan, says Anker-Holth relies on Pittsburgh Steel tubing for this missile component.

With Pittsburgh Steel's Tubing



Final hydraulic testing on completed cylinders is comprised of 30 cycles at 4,500 psi—using special Anker-Holth testing equipment.

Fast service, straightness, and minimum stock removal convinced Anker-Holth that "Pittsburgh was best we could get for this job." Cylinder measures 5 inches by 4 inches by 143 inches. Anker-Holth specializes in power cylinders with bores from one to 48 inches, and strokes to 45 feet.

Steel's answer was in first, and it suggested less stock removal.

"That's important, and it's one reason Pittsburgh Steel stays with us. We ask them for size recommendations that we need for cleanup. They tell us the size, and they do it in a hurry. They don't wait around for a couple of months to reply.

"For another thing, when we first started production of this cylinder, we had a problem of straightness.

"I don't know how they did it, but Pittsburgh Steel came through with a batch of tubing I had never seen the equal of. Pittsburgh makes a quality tube. Straightness is the big thing—plus service and the amount of stock we must remove. With Pittsburgh Steel Seamless Tubes we don't need extra metal for honing—so we aren't paying for metal we don't use."

Experience Pays—Close attention to customers' needs and experience, plus steelmaking skills and production practices developed in nearly 50 years of seamless tube production, make Pittsburgh Steel able to serve Anker-Holth this way.

In this instance, Pittsburgh Steel's ability to produce commercial quality cold-drawn seamless mechanical tubing to exacting standards for straightness, concentricity and tolerances, allows Anker-Holth to simplify its cleanup process of the cylinder's ID and centerless grinding of the piston rod's OD.

Machinability and weldability of Pittsburgh Steel's tubing are vital factors in Anker-Holth's production, too, because plugs, ports, sleeves, piston and end covers are threaded and/or welded to the piston rod and cylinder in this application.

Contact one of the distributors or district sales offices listed below. Then let Pittsburgh Steel Company demonstrate its ability and readiness to help. You, too, will find that Pittsburgh Steel's tubing is the best you can get.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond, McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Standard Tube Sales Corp.
Brooklyn, New York

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Co.
Boston, Massachusetts

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta, Chicago, Cleveland, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

Dealers Eye October Action

Most dealers are in agreement that things will remain quiet until October.

Therefore, September has been written off and fingers are crossed. For dealers, the present picture is a dark one.

■ It now appears that the shot-in-the-arm for scrap won't come before October, if then. And chances are, the picture for dealers will continue to be dark until then.

The situation can best be summed up in the fact that mills are not eager to buy and dealers are not eager to sell at current prices. And a major price increase in the near future is unlikely.

Actually, the entire national market is "very quiet" this week. St. Louis, where the market was firm in recent weeks, is now "fairly slow." Pittsburgh provides no new activity and Philadelphia is "inactive."

The only real market firmness is in Birmingham where sales of foundry scrap and plate improve the market tone.

Several areas report brokers and dealers are adopting a "wait and see" attitude. Bullishness appears to be vanishing. Nevertheless, the only area reporting possibilities of any softer market tones is Detroit.

The export question continues to worry some dealers. Reports from the West Coast indicate exports are moving at "a limp pace." Detroit dealers claim Canada is inactive and overseas shipments are waning. Nevertheless, New York scrapmen don't see any sign of export sales slackening this fall.

Pittsburgh—Prices of most grades are unchanged as the market shows no new activity. A small amount of scrap is moving to the Valley. September industrial lists show larger offerings than those for August. But there is no significant activity. Dealers cannot bring in any volume of scrap at current prices. Nor can they sell any volume at current prices.

Chicago—The market remains at a lull following a mild strengthening last week. Trade is standing by watching for factory bundle list prices. But opinions vary widely as to what price lists will bring. Mill pessimism about September steel shipments has taken some of the steam out of the scrap market. But it hasn't resulted in any definite weakening.

Philadelphia—The market is still inactive. One broker summed it up as "still nothing stirring." What tonnage is moving is largely export. Some dealers say that business is running as high as 95 pct export. The general consensus still seems to be that October is the soonest possible month for a flurry of activity.

New York—Export remains the dominant factor in an otherwise dull market. Orders for export are in for September and October. The trade doesn't see any sign export sales will slacken off this fall. Domestically, there is some activity in foundry grades. Openhearth grades are inactive.

Detroit—Predictions of a softer market next month are being made now by brokers and dealers. They say the closing of the September industrial list will be responsible. There are no dealer sales, and scrap movement is at a standstill. Overseas exports are waning and Canadian activity is quiet.

Cleveland—Bullishness has cooled off as new orders failed to come out. Some new small special sales are going at $36 in the Valley area. But the bulk of tonnage is moving at $35 and coming from the local area. Foundry steel is moving because of new car production.

Cincinnati—Mills are not eager to buy and dealers are not eager to sell at the present levels. Low volume in shipments is expected to continue next month unless mills decide to hedge against price increase later.

St. Louis—Movement of scrap steel remains fairly slow. However, the undertone continues to show signs of strength. The situation seems to be one of "sit and wait." It is felt that a little better demand could trigger an upturn.

Birmingham — Sales of foundry scrap and plate have improved and the market appears a little stronger for these items. Cast advanced $1 a ton when a large pipe manufacturer returned to the market. Brokers say cast is becoming hard to find.

Buffalo—A small purchase of cupola cast was made at quoted prices. There were no other sales and the prices are unchanged. It appears that dealer and plant inventories are ample.

Boston—Activity is unchanged, but with a slight undertone of firmness. Export still maintains the market at its present level. No price changes.

West Coast—Exporting remains the only life in the market, but at a limp pace. Reports persist that the Japanese plan to cut their buying about 25 pct in the final quarter.

Houston — The market is very quiet and brokers have adopted a "wait and see" attitude. The only strength is in exports. There are no price changes.

Will President Veto Lead-Zinc Bill?

Disputed bill authorizing subsidies for small producers of lead and zinc has passed both the Senate and House.

While there's no definite word, a veto by the President is possible.

▪ President Eisenhower will probably decide this week whether or not he will veto the controversial lead-zinc bill.

The bill, authorizing subsidies for the depressed lead and zinc mining industries, passed its next-to-last hurdle, the Senate, last Friday.

Aids Small Producers—The subsidies apply to producers of under 2000 tons of each metal yearly. The bill carries authority for subsidies up to $4,840,000 a year for five years.

The measure was authorized by Rep. Ed Edmondson (D.—Okla.), and final passage climaxed a 12-year fight by mining state congressmen to aid lead and zinc producers.

Price Floor Set—Under the bill, miners would be subsidized when the world price of lead fell below 17¢ a pound and 14.5¢ a pound on zinc.

Opposition to the bill—it passed the Senate 59 to 28—came from those who estimated the subsidies would mean government payments as high as $200,000 a year to individual miners. The opponents said the bill would set a bad precedent, because it would open the way for other mineral interests to seek similar Federal aid.

The bill's backers argued the subsidy was "a very modest sum," but meant "life or death to hundreds of miners."

The President has given no definite word on the possibility of a veto of the bill. But top Republican leaders in the Senate voted against the bill.

Aluminum Battles Export Problems

Spokesmen for the aluminum industry met last week with the U. S. Commerce Dept. to discuss ways to increase industry exports. They expressed concern over the Common Market's proposed tariffs on aluminum products.

By 1970, they said, the Common Market can be expected to impose an external tariff of from 10 to 15 pct on semifabricated aluminum entering the six European market nations from the U. S. and other countries.

Countermoves Considered—Some felt the only solution might be expanding operations abroad, particularly in Europe, in order to sell their products there.

Industry spokesmen added they might be forced to establish plants in less developed areas nearer to their raw material sources to meet the competition.

The aluminum industry representatives stressed the price disadvantages they have in competition with foreign companies both home and abroad.

Why Others Succeed—They told Commerce Dept. officials they must compete in foreign markets with competitors who are, in some instances, government owned or controlled.

Some of these foreign companies have the benefit of special financial or tax incentives not available to U. S. producers, they said.

For an example they compared last month's prices. They said 54 out of 65 foreign prices were lower than those of the U. S. And over one-half of the foreign prices were 20 pct lower.

U. S. Action Urged—To solve the industry's foreign trade problems, they urged a government policy covering all major phases of aluminum international trade.

The policy, they said, should recognize inter-relationships of exports, foreign investments, import competition, and market developments at home and abroad.

The industry men specifically recommended the U. S. seek at upcoming negotiations of the General Agreement of Tariffs and Trade (GATT), a reduction of aluminum tariffs of all GATT members to present U. S. levels.

Tin prices for the week: Aug. 17—102.00; Aug. 18—101.875; Aug. 19—101.00; Aug. 22—101.625; Aug. 23—101.625.*
* Estimate

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colborne, Canada. **ZINC:** prime western. **TIN:** See above; Other primary prices, pg. 136.

SCRAP PRICES

(Effective August 23, 1960)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	38.00 to 39.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	47.00 to 48.00
No. 1 machinery cast	47.00 to 48.00
Cupola cast	38.00 to 39.00
Heavy breakable cast.	36.00 to 37.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	90.00 to 95.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	42.00 to 43.00
Low phos. punch'gs plate, ¼ in. and heavier	38.00 to 39.00
Low phos. 2 ft. and under	36.00 to 37.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	53.00 to 54.00
Rails 2 ft. and under	49.00 to 50.00
Angles and splice bars	43.00 to 44.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	40.00 to 41.00
No. 1 machinery cast	46.00 to 48.00
Cupola cast	41.00 to 42.00
Cast iron wheels	32.00 to 33.00
Malleable	45.00 to 46.00
Stove plate	34.00 to 36.00
Steel car wheels	39.00 to 40.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	51.00 to 52.00
Cupola cast	38.00 to 39.00
Heavy breakable cast	39.00 to 40.00
Cast iron car wheels	40.00 to 41.00
Malleable	45.00 to 46.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	35.00 to 36.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast	37.00 to 38.00
Hvy. breakable cast.	31.00 to 32.00
Drop broken cast.	49.00 to 50.00

Youngstown

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	37.00 to 38.00

Cleveland

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	34.50 to 35.50
No. 2 bundles	19.00 to 20.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft. & under	37.00 to 38.00
Low phos. punch'gs plate	33.00 to 34.00
Drop forge flashings	32.00 to 33.00
Foundry steel, 2 ft. & under	34.00 to 35.00
No. 1 RR hvy. melting	34.50 to 35.50
Rails 2 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast	47.00 to 48.00
No. 1 machinery cast	46.00 to 47.00
Stove plate	39.00 to 40.00
Malleable	45.00 to 46.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft. and under	38.00 to 39.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft. and under	47.00 to 48.00
No. 1 machinery cast	46.00 to 47.00
No. 1 cupola cast	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
Foundry steel, 2 ft.	31.00 to 32.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. melting	32.50 to 33.50
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	41.00 to 42.00
RR specialties	39.00 to 40.00
Cupola cast	42.00 to 43.00
Heavy breakable cast.	35.00 to 36.00
Stove plate	35.00 to 36.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	52.00 to 53.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft. & under	32.00 to 33.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft.	37.00 to 38.00
No. 1 RR hvy. melting	30.00 to 31.00
Scrap rail, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	38.00 to 39.00
No. 1 cupola cast	46.00 to 47.00
Stove plate	46.00 to 47.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	34.00 to 35.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stainless	
18-8 prepared solids	165.00 to 170.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	26.00 to 27.00
Drop forge flashings	26.00 to 27.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	35.00 to 36.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $24.50
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 24.50
No. 2 bundles	14.00 to 15.00
No. 1 busheling	24.00 to 24.50
Machine shop turn.	5.00 to 6.00
Shoveling turnings	8.00 to 9.00
Clean cast. chem. borings	12.00 to 13.00
No. 1 machinery cast	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	27.50 to 28.50

San Francisco

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	30.00
No. 1 dealer bundles	....	30.00
No. 2 bundles	....	20.00
Machine shop turn.	$14.00 to	15.00
Cast iron borings	14.00 to	15.00
No. 1 cupola cast.	....	46.00

Los Angeles

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	29.00
No. 1 dealer bundles	....	27.00
No. 2 bundles	....	17.00
Machine shop turn.	....	13.00
Shoveling turnings	....	15.00
Cast iron borings	$15.00 to	16.00
Elec. furnace 1 ft. and under (foundry)	42.00 to	43.00
No. 1 cupola cast.	....	44.00

Seattle

No. 1 hvy. melting	....	$35.00
No. 2 hvy. melting	....	33.00
No. 2 bundles	....	22.00
No. 1 cupola cast	....	36.00
Mixed yard cast	....	36.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	....	$25.80
No. 2 hvy. melting cut 3 ft. and under	....	22.50
No. 1 dealer bundles	....	25.80
No. 2 bundles	....	19.00
Mixed steel scrap	....	16.00
Bush., new fact., prep'd	....	25.50
Bush., new fact., unprep'd	....	20.45
Machine shop turn.	....	12.00
Short steel turn.	....	12.00
Mixed bor. and turn.	....	12.00
Cast scrap	....	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	29.00
No. 2 bundles	....	18.00
Machine shop turn.	....	12.00
Shoveling turnings	....	14.00
Cut structural plate 2 ft. & under	$40.00 to	41.00
Unstripped motor blocks	26.00 to	27.00
Cupola cast.	32.00 to	33.00
Heavy breakable cast.	25.00 to	26.00

cast iron wheels

for railroad wagons

Slightly more than two centuries ago, cast iron wheels were introduced for railroad wagon use. At first, only the forward axles were so equipped, in the belief that brakes would not hold on iron. But this theory was soon disproved—and cast iron was adopted for both rear and front wheels.

Now, on the country's rails and highways, wheels of iron or steel transport a vast tonnage of industrial and agricultural products—the vital needs for civilian and military use. To meet the ever-increasing demand for wheels, the supply of scrap must be constantly maintained.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M.S. KAPLAN COMPANY

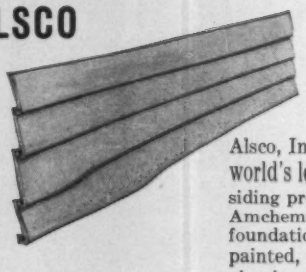
231 S. La Salle St., Chicago

Telephone ANdover 3-3900

1960—OUR 50th YEAR

7 of the finest in the field specify

ALSCO

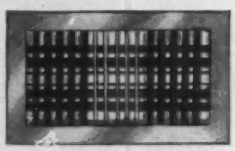


Alsco, Inc., one of the world's leading aluminum siding producers specifies Amchem Alodine® as the foundation for a successfully painted, durable aluminum surface.

GENERAL BRONZE

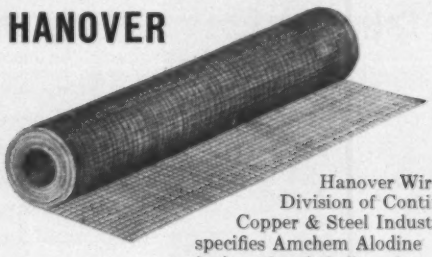
The Alwintite Division of General Bronze Corp. specifies Amchem Alodine and Amchem Aluminum Etchant for a superior, long lasting finish on their popular line of residential aluminum windows.

KRUEGER



Krueger Air Conditioning Corp. specifies Amchem Granodine® for superior pre-paint protection and paint adhesion on steel registers, grilles and diffusers for air conditioning and heating.

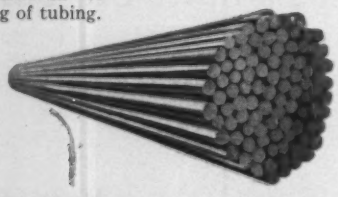
HANOVER



Hanover Wire Cloth Division of Continental Copper & Steel Industries specifies Amchem Alodine as the base for their line of non-glare, corrosion-resistant, color-fast aluminum screening.

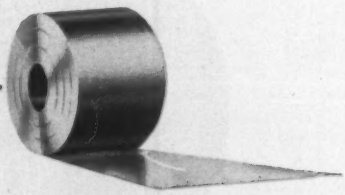
WALLINGFORD STEEL

Wallingford Steel Company, one of the world's largest producers of stainless steel tubing, specifies Amchem Granodraw SS® to facilitate forming of tubing.



CAROLINA METALS

One of the country's top painted aluminum strip processors, Carolina Metal Products Corp., specifies Amchem Alodine for continuous strip pre-paint treatment of aluminum.



AMCHEM for the finest in paint bonding and coating chemicals

BOEING AIRCRAFT

Internationally known Boeing Aircraft Co. specifies Amchem Alodine as a pre-paint treatment, and to treat unpainted portions of the famous 707 jetliner fuselages and engine pods.

If you're looking for superior corrosion resistance, paint bonding and coating performance . . . write for complete information on these and other Amchem chemicals for the metalworking industry.

AMCHEM

Amchem, Alodine, Granodine and Granodraw are registered trademarks of

AMCHEM PRODUCTS, INC.

(Formerly American Chemical Paint Co.)

AMBLER, PA.

Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.038	.048-.061	.077-.096	.136-.250
1100, 3003	47.8	47.3	46.2	45.1
5052	54.2	53.0	50.8	49.2
6061-0	51.0	49.8	47.9	46.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	44.7-46.2	53.2-60.8
18-32	45.2-46.8	57.7-79.9
33-38	48.8-51.4	83.3-94.5
39-44	58.7-62.4	99.9-121.0

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Munts Metal	53.20	.....	48.26	.....
Momm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.10	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, H'R, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb) ....$1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 29.95 to 36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York .....$210 to $212
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 29.25
No. 120 ..... 28.25
No. 123 ..... 27.25
80-10-10 ingot
No. 305 ..... 33.75
No. 315 ..... 31.50
88-10-2 ingot
No. 210 ..... 42.00
No. 215 ..... 38.75
No. 245 ..... 34.00
Yellow ingot
No. 405 ..... 23.75
Manganese bronze
No. 421 ..... 28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.25-25.50
0.60 copper max. 25.00-25.25
Piston alloys (No. 132 type)..27.00-28.00
No. 12 alum. (No. 2 grade)...23.75-24.25
108 alloy 24.25-24.75
195 alloy 26.75-27.75
13 alloy (0.60 copper max.)...24.75-25.00
AXS-679 (1 pct zinc) 24.00-25.00

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 24.75-25.75
Grade 2—92-95% 23.50-24.50
Grade 3—90-92% 22.50-23.50
Grade 4—85-90% 22.00-23.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26½	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27¾
No. 2 copper wire 26
Light copper 23¾
*Refinery brass 24
Copper bearing material 23
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 26¾
Light copper 23¼
No. 1 composition 22
No. 1 comp. turnings 21¼
Hvy. yellow brass solids 16¾
Brass pipe 15
Radiators 17¾

Aluminum

Mixed old cast. ..... 13½—14
Mixed new clips ..... 14½—15½
Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 23½—24
No. 2 copper wire ..... 21½—22
Light copper ..... 19½—20
Auto radiators (unsweated).. 13¼—13¾
No. 1 composition ..... 18 —18½
No. 1 composition turnings... 16½—17
Cocks and faucets ..... 13¾—14¼
Clean heavy yellow brass ... 12¾—13¼
Brass pipe ..... 14¼—14¾
New soft brass clippings .... 14½—15
No. 1 brass rod turnings .... 13¼—13¾

Aluminum

Alum. pistons and struts .... 7½— 8
Aluminum crankcase ..... 9½—10
1100 (2s) aluminum clippings 12½—13
Old sheet and utensils ..... 9½—10
Borings and turnings ..... 5½— 6
Industrial castings ..... 10 —10½
2020 (24s) clippings ..... 12½—13

Zinc

New zinc clippings ..... 7 — 7¼
Old zinc ..... 4½— 5
Zinc routings ..... 3¼— 3½
Old die cast scrap ..... 2¾— 3

Nickel and Monel

Pure nickel clippings 52-54
Clean nickel turnings 40
Nickel anodes 52-54
Nickel rod ends 52-54
New Monel clippings 23-23.50
Clean Monel turnings 16.50-17
Old sheet Monel 22-23
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8 — 8¼
Battery plates (dry) ..... 3 — 3¼
Batteries, acid free ..... 2 — 2¼

Miscellaneous

Block tin ..... 79 —80
No. 1 pewter ..... 59 —60
Auto babbitt ..... 43 —44
Mixed common babbitt ..... 10¼—10¾
Solder joints ..... 14½—15
Siphon tops 41
Small foundry type ..... 9¾—10¼
Monotype ..... 9¾—10¼
Lino. and stereotype ..... 8¾— 9
Electrotype ..... 7½— 7¾
Hand picked type shells ..... 5¼— 5¾
Lino. and stereo. dross ..... 2¼— 2¾
Electro dross ..... 2¾— 2¾

(Effective Aug. 23, 1960)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				15.55 *C11*
	Harrison, N. J.													
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1, T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,C4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.90 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.50 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Aug. 22, 1960)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

? Electrogalvanized sheets.

(Effective Aug. 22, 1960)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr'a. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875*L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Aug. 22, 1960). * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	.....	.....	.....
Boston**	.10	9.77	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.80	9.95	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.70	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.02	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	8.81	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	10.03	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[3]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	.....	11.39	10.27	10.48	10.07	12.89	.....	.....	.....	.....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	8.84	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	8.95	10.10	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	8.70	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.50	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.92	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.61	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 1⅞ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Aug. 22, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	73.00
Lyles, Tenn. *T3*	.....	.....	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

‡ Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

‡ Plain finish—packaged and bulk. 50
Hot galvanized and zinc plated—packaged 43.75
Hot galvanized and zinc plated—bulk 50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk. 50
Hot galvanized and zinc plated—packaged 43.75
Hot galvanized and zinc plated—bulk 50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk. 50
Hot galvanized and zinc plated—packaged 43.75
Hot galvanized and zinc plated—bulk 50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	25.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	31.75 48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5, R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*; Reading, Pa., *C2*; Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Ambridge, Pa., *B7*; Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Aug. 22, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	.....	190	9.00	9.675
Atlanta *A8***	173	191	....	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	236	.....	9.95	10.50
Sparrows Pt. *B3***	175	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

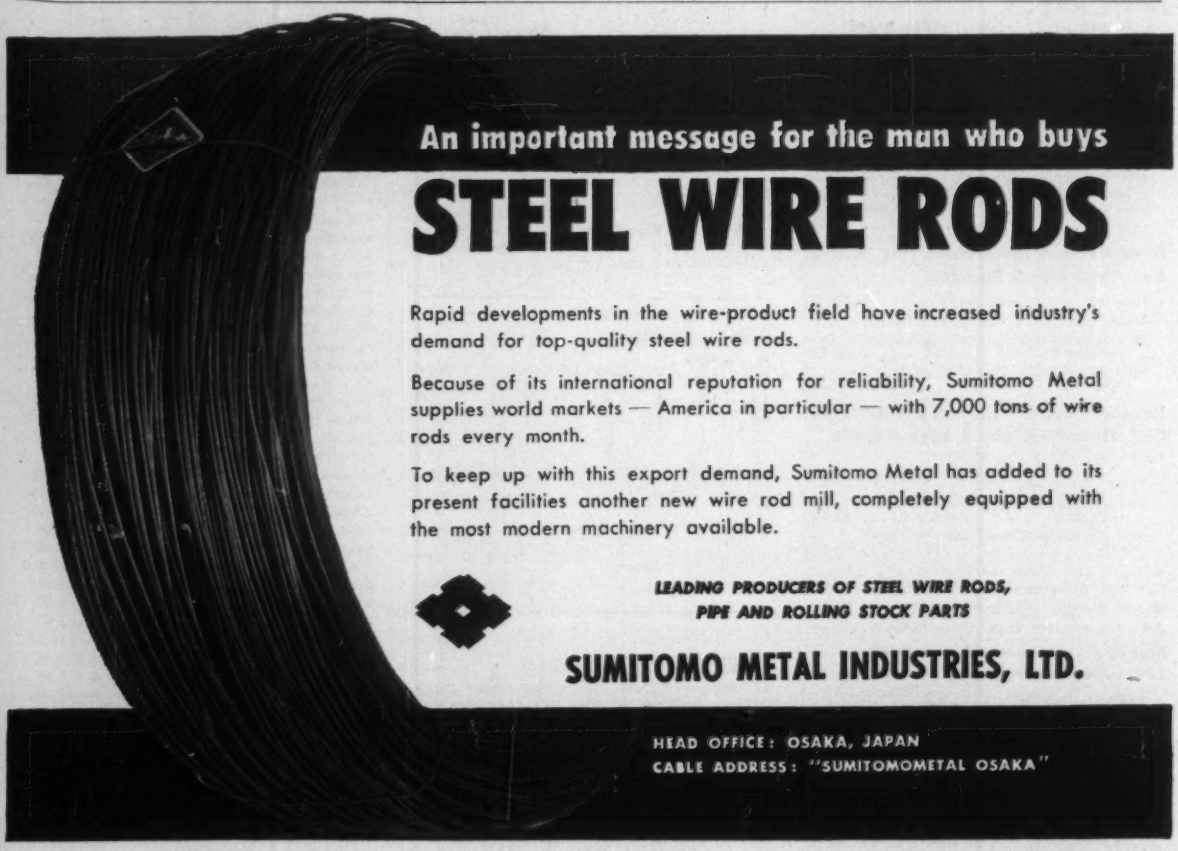
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75



An important message for the man who buys

STEEL WIRE RODS

Rapid developments in the wire-product field have increased industry's demand for top-quality steel wire rods.

Because of its international reputation for reliability, Sumitomo Metal supplies world markets — America in particular — with 7,000 tons of wire rods every month.

To keep up with this export demand, Sumitomo Metal has added to its present facilities another new wire rod mill, completely equipped with the most modern machinery available.

LEADING PRODUCERS OF STEEL WIRE RODS, PIPE AND ROLLING STOCK PARTS

SUMITOMO METAL INDUSTRIES, LTD.

HEAD OFFICE: OSAKA, JAPAN
CABLE ADDRESS: "SUMITOMOMETAL OSAKA"

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *C4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.70	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7,a*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Castle, Pa. *M10,*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
- Rolled elliptical, 18 in. or longer, 5000 lb lots 48.00
- Electrodeposited, 5000 lb lots ... 39.50

Brass, 80-20, ball anodes, 2000 lb or more 53.00

Zinc, ball anodes, 2000 lb lots 20.50
(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225
(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.40

Tin, ball anodes $1.05 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum..... 65.90

Copper sulphate, 25.2 Cu min, 6000 to 12,000 lbs per cwt $13.75

Nickel sulfate, 5000 to 23,000 lbs... 29.00

Nickel chloride, freight allowed, 100 lb 45.00

Sodium cyanide, domestic, f.o.b. Chicago, 200 lb drums 25.00

Zinc cyanide, 100 lb 69.75

Potassium cyanide, 100 lb drum N. Y. 45.50

Chromic acid, flake type, 10,000 lb or more 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R.	11.50
Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots	25.75
Carbonyl Iron (200 lb lots)	88.00
Welding Grades	8.10
Cutting and Scarfing Grades	9.85
Hydrogen reduced, domestic	11.25

Copper Powders

Molding Grades	
Electrolytic, domestic, f.o.b. shipping point.	15.00†
Atomized	46.5 to 64.5
Reduced	15.00†
Chemically Precipitated	15.00†
Brass, 5000-lb lots	35.1 to 52.2
Bronze, 5000-lb lots	53.1 to 56.7
Chromium, electrolytic	5.00
Lead	7.50†
Manganese, electrolytic ...	$1.00
Molybdenum .....$3.60 to $4.35	
Nickel	$1.15
Carbonyl Nickel, 20,000 lb lots	$1.01
Nickel-Silver, 5000 lb lots..	60.7 to 69.0
Silicon	70.00
Solder	7.00†
Stainless Steel, 316	$1.07
Stainless steel 304	89.00
Tin	14.00†
Titanium, 99.25 + pct, per lb, f.o.b.	$11.25
Tungsten .....$3.15 (nominal)	

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (*L4, C4, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type 302	.....	.....	.....	37.50
304	28.80	31.55	34.30	40.00
316	42.20	46.25	50.25	58.75
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	.....
410	22.70	24.85	27.00	.....
430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

(Effective Aug. 22, 1960)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky....	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk...	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00	
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.$109.00	
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore $140.00	
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $73.00	
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks 52.00-54.00	

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

ELECTRODES

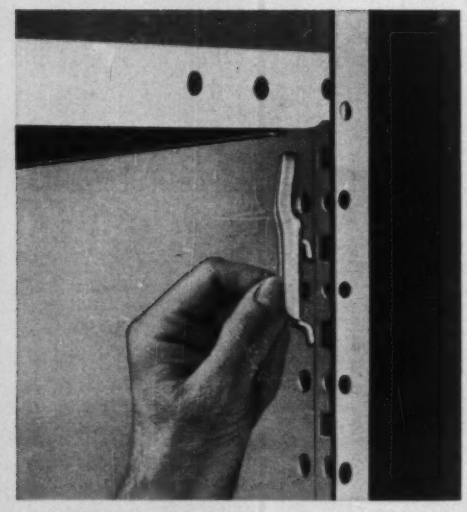
Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

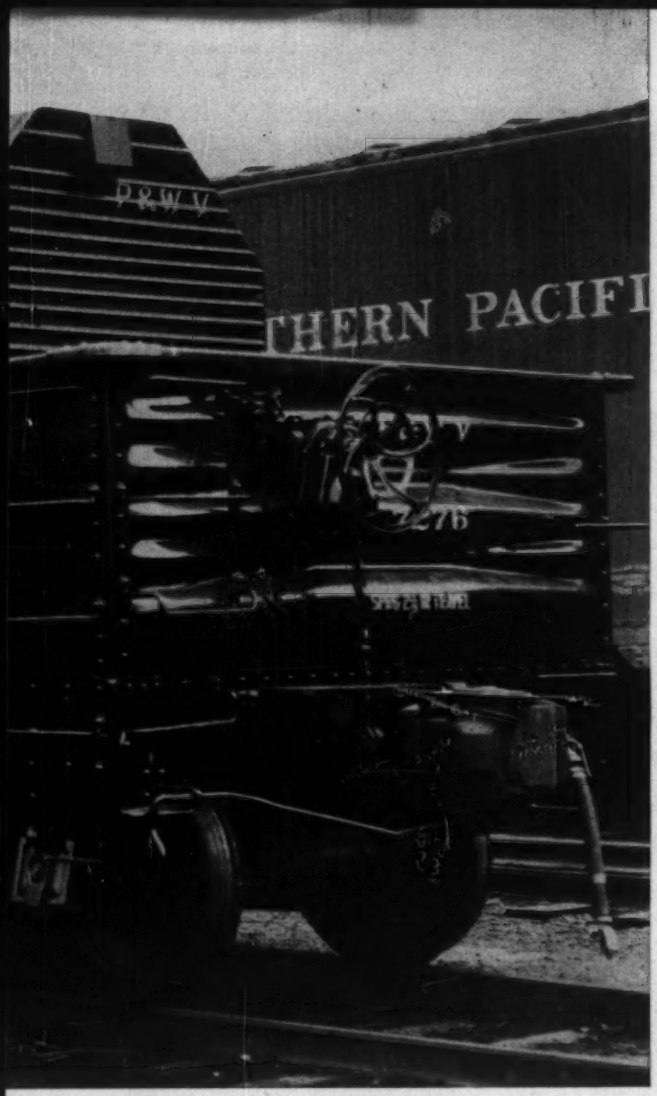
BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....



NEW FROM REPUBLIC—COMPRESSION SHELF CLIP solves stock and store problems quickly, easily, economically. Designed to ease and speed steel shelving erection. No tools needed. Simply slip clips onto uprights, snap shelf in place. Adjustable, reusable. Supports heavy loads safely. Write for complete information.

REPUBLIC METAL LUMBER provides faster, stronger, safer framing in any application where common building materials are now being used. Simply measure, cut, assemble. Fabricated from cold rolled steel to assure uniform physical properties and high strength-to-gage ratio. Bonderized for complete protection of all exposed surfaces. Engineered slotted angle pattern speeds erection, reduces time and material costs. Available in two gages, two widths, in standard bundles of 10- or 12-foot lengths. Send for attractive brochure.



protect cargoes with

REPUBLIC COIL COVERS

Republic Coil Covers speed and simplify freight handling, protect cargoes in transit, stop vandalism.

Designed for use on standard gondola and flat cars. Approximately 22 feet long, 6 feet wide, and 6 feet high. Two covers are furnished for each car.

Constructed of 13-gage sheets with 3/16" reinforcing members. Corrugated steel construction provides added strength, assures long service life at lowest per-year cost. Weight: Approximately 2,400 lbs. per cover.

Republic Coil Covers are easily handled by overhead or track-side cranes. Six specially designed stacking brackets permit easy tiering during loading-unloading operations.

To offer your customers the best possible protection, ship with Republic Coil Covers. Call your Republic representative, or write direct.

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Steel Arena
1960 METAL SHOW
PHILADELPHIA
OCT. 17-21
BUILD IT BETTER WITH AMERICA'S STEEL

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

STANDARD REPUBLIC MATERIAL HANDLING UNITS save time in stack, store, ship operations. Reduce storage space requirements. Corrugated construction designed to deliver long, trouble-free service. Four-way fork channels simplify handling in restricted areas. Engineered stacking brackets permit safer tiering in handling and storing. Republic material handling specialists will recommend proper Republic Units to save production time and costs. Write today.

REPUBLIC STEEL CORPORATION
DEPT. IA-1062-A
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

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☐ Republic Coil Covers
☐ Republic METAL LUMBER®
☐ Compression Shelf Clips
☐ Material Handling Units

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

GUARANTEED—RE-NU-BILT

Electric Power Equipment — A. C. Motors

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-579BS	4800	1800
1	800	Whse	CW	500	1776
1	800	G.E.	MT-428	2200	450
1	600	Whse.	CW	220/440	900
1	600	Whse.	CW-4-32D-15	440	1778
1	550	Whse.	CW	440	252
1	500	Whse.	CW	550	350
1	300	A.C.	ANY	440/2300	720
1	300	G.E.	MTP561	2200	1800
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Cr.Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	200	G.E.	IE-13B	220	1800
2	200	Whse.	CW-890	2300	1775
1	200	G.E.	IM	440	435
1	150	G.E.	IM-17	440	435
1	200	G.E.	IM	2200	580
1	125	G.E.	MT-557	220/440	1200
3	100	A.C.		440	695
1	100	G.E.	M-6335Z	220/440	580

SQUIRREL CAGE

1	500	G.E.	FT-559AY	2200	3600
2	500	Whse.	CSP-583H	440	3600
1	500	Whse.	CS-1115	2200	863/445
4	500	Whse.	CS-1216	2200	500
2	450	Ell.	F-3010	2200	1200
1	400	Whse.	CS-7151 610H	6600/4000	3585
1	300	Whse.	CS-1002	2300/440	600
1	250	Whse.	CS-875S	2200	1775
1	200	Whse.	CSP-581S	449	3450
2	200	Whse.	CS-855S D.P.	220/440	1750
200/150		Whse.	CS-963H	2300	1175/878
1	150	G.E.	FT-558	2200	875
1	150	Whse.	CS	440	580
1	125	Whse.	CS-764C	220/440	1160
3	100	Whse.	CS-760C	2200/440	1160
1	100	Whse.	B.B.CS-607-220/440		1780

SYNCHRONOUS

1	6000	G.E.	ATI.8	200/6600	600
1	3500	G.E.	TS 1.0	4600/2300/4000	360
2	1750	G.E.	ATI	2300	3600
2	500	G.E.	TS-9569.8P.F.	2200	1200
1	400	G.E.	TS-7565	2200	1200
2	350	G.E.	ATI 1.0P.F.	2300	150
1	325	G.E.	ATI 1.0P.F.	440	1800
2	300	El Mach.	BRKT	2200	1200

BELYEA COMPANY, Inc.

47 Howell Street, Jersey City 6, N. J.

Tel. OL 3-3334

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS

3 Phase—60 Cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
1**	5000	Ideal	Mill	6600/4160	440
1**	2500	G.E.	Mill	2300	294
1**	2500	G.E.	Mill	6600/4160	257
1**	1800	Whse.	Mill	2300	252
1**	1750	Whse.	Mill	2300	234
1**	1500	Al.Ch.	Mill	2300	508
1**	1300	Al.Ch.	Mill	2300	353
1**	1200	Al.Ch.	Mill	2300	505
1**	900	Al.Ch.	Mill	2300	169
1*	700	Whse.	CW-1234A	2300	585
1	500	Al.Ch.	ANY	2300	1175
1	500	Ideal	S-4-20	4800	706
1*	500	Al.Ch.	ANY	2200	505
1**	500	Al.Ch.	ANY	2300	393
1*	400	Al.Ch.	ANY	2200	506
1	400	Whse.	CW	2300	200
8	350	G.E.	I-M	2200	1180
1	300	G.E.	IE-15B	440	1200
1	300	Whse.	CW-1012	2200	704
1	250	Whse.	CW	4160/2400	710
1	250	Cr.Wh.	SB size Q	4600/2300	350
1	250	G.E.	MT-414	2200	300

**—Heavy duty, pedestal bearing, stator shifting bases.

*—Heavy duty, pedestal bearing, standard base.

OUTDOOR CIRCUIT BREAKERS

(Air—3-Pole)

Qu.	Amps.	KV	Make	Type	Int.	Cap.
8	1200	14.4	G.E.	ARA	1000	M.V.A.
3	1200	5	G.E.	AM	100	M.V.A.

(Oil—3-Pole)

1	400	73	Whse.	G-11	500	M.V.A.
1	600	69	G.E.	FK-339	500	M.V.A.
1	600	37	G.E.	FHKO-236	500	M.V.A.
1	400	37	G.E.	FHKO-136	250	M.V.A.
1	600	34.5	Al.Ch.	FKO-50-34X	250	M.V.A.
1	600	7.2	G.E.	FKO-227	50	M.V.A.

Transformer & Switchgear Package

3—833-KVA Allis-Chalmers Transformers, 1 ph., 60 cy., 13475/12375-11000/10175-V. Prim., 2300/4000-V. Secondary

1—G.E. Mag. outdoor O.C.B., type F.L.O., 600 amps., 14.4-KV, 250-MVA, int. cap.

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address: "Macsteel" Philadelphia, Pa. Phone: Davenport 4-8300

1960 Could Top Last Year

Used machine dealers are looking for 1960 to end better than 1959.

Government contracts and high price tags on new machines may hold the key to additional fourth quarter sales.

■ Used machinery dealers feel that 1960 could end on a brighter note than 1959. Of course strong fourth quarter activity is needed.

Two factors may bring good end-of-the-year business. It is expected that the new fiscal year for the government will mean additional contracts. And, the Machine Tool Exposition in Chicago next month could result in sales.

One New York dealer notes, "I expect the government to step on the gas soon, and there will likely be a flood of new contracts."

Dealers hope also that smaller buyers will get a good, hard look at price tags at the exposition. Says one: "Shops with under 1000 employees couldn't make the high-priced machinery pay for itself in a month of Sundays." He also adds, "They'll be back to us for what they need."

Sources and Prices — And the used machine dealers are arranging it so small buyers won't have far to go.

Machinery Dealers National Assn. plans to have a booth at the Chicago show. Highlight of this effort will be lengthy, classified listings of available used machine tools. Sources and prices will be listed. This strategy brings price contrast in front of the small buyer.

In New York, dealers are far from satisfied with current business. Nevertheless, many admit that things are running very close to last year's level. There are those who aren't doing as well. But others are doing better.

Hustle Needed — Many dealers say the potential for better business is there. It's the same story as that summed up by a dealer in July: "There's business to be had, but you have to hustle for it more than ever before."

One dealer notes, "We have plenty of inquiries and some are starting to come through."

Another dealer reports of having one prospect who has already selected his machine. The selection has been cleared by his engineering and purchasing departments. The deal is now pending the receiving of an expected government contract. The dealer says, "When the contract comes through, all I have to do is ship the machine."

"Not So Bad"—There is also the case of a New York dealer who was doing "so-so" business one month ago. Now, because of a couple of orders this month, he says business is "not so bad."

Apparently there is no shortage of good used tools. A dealer reports he is having no trouble getting 98 pct of the demanded items. Business is fairly good in heavy presses. Dealers say that companies now keep these presses for shorter periods of time than they used to.

STAMPING & FORGING EQUIPT.

LATE MODELS—MDNA

MONEY BACK GUARANTEE

1300-Ton Nat'l. Maxipres, 80 SPM, 10" Str., 1955
920-Ton Toledo #60, Bed 47x72, Str. 20", 1943
700/390-Ton Toledo #797E, Bed 127x83, Dbl. Act. Toggle, Air Clutch & Cushion
600-Ton Ferracute E601, Coining, Str. 6", 30 SPM, 1950
440-Ton Bliss #210, Bed 37x36, 35 SPM, Side Shear, Str. 16", Mfg. 1953
440-Ton Toledo #59¼, Bed 41x48, Str. 12"
255-Ton Toledo #58½B, Bed 43x42, Str. 12"
150-Ton Cleve. 60-D-84, Bed 86x46, Str. 14"
3000# Chambersburg "Ceco Drop" Hammers, 1951

NEW RADIAL DRILLS

4½'x15" MAS-VR4A #4MT, 2500 RPM, Preselection, Hyd. Clamping, program control.
12'x26" MAS-VR103, #6MT, 9' Vert. Cap 5", Hole cap., 20 HP 1400 RPM

PRESSES WANTED

Phone or write Max Wender for top prices on your surplus stamping & forging equipment.

WENDER PRESSES Inc.

1957C Clay Detroit 11 Trinity 2-1270

UNIVERSAL Machinery & Equipment Co.

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

ARC MELTING FURNACES
250# LECTROMELT—185 KVA
500# LECTROMELT—200 KVA
1000# SWINDELL—500 KVA
2000# SWINDELL—1000 KVA
3000# HEROULT, Door Charge—800 KVA
10' Top Charge Arc Melting Furnace
12' SWINDELL Top Charge—5000 KVA
DETROIT FURNACES—10 lb. to 3000 lb. Cap.

INDUCTION FURNACES
20 KW AJAX Spark Gap 17# Melting
30 KW VACUUM Melting, Complete—Like New
100 KW AJAX Melting Installation—Late
200 KW, 960 cycle, 1000# steel

DUPLEXING ARC FURNACE
Hydroarc Controls

HEAT TREAT FURNACES
4'x4'x10' Gas Fired Box
7' G. E. Rotary Hearth Electric, 1900°F.
36" dia. x 36" deep Electric Recirculating
46" wide Roller Hearth 50'L w/atmos. gen.
24"x16'Lx36"H, 210 KW LINDBERG conveyor type, 1400°F.
10"x12"x24" LINDBERG 2500°F. hydrogen

CLEANING EQUIPMENT AND GRINDERS
20x27 WHEELABRATOR
27x36 WHEELABRATOR w/loader
36x42 WHEELABRATOR w/loader
48x42 WHEELABRATOR w/loader
dust Collectors available for all machines
WHEELABRATOR No. 1-A Multi Table
48" WHEELABRATOR Swing Table
72" WHEELABRATOR Swing Table
96" WHEELABRATOR Swing Table
6' LK PANGBORN Table-room
PANGBORN Pipe Cleaner, 2" to 14" O.D.
SAFETY 10 H. Swing Grinder
WHITING 26"x54" tumbling barrel

. . . SPECIAL . . .
15 Ton Double Leg A.C. Gantry Crane
50" Magnet

Model 43 LIQUAMATTE wet blasting cabinet. Brand New. Ideal for finishing and cleaning tools, dies, molds, etc. at 50% SAVINGS.

1630 NORTH NINTH ST. READING, PA. PHONE FRANKLIN 3-5103

R. R. EQUIPMENT

HOPPER TANK CABOOSES
FLATS GONDOLAS BOXES
AND SPECIAL DESIGNS

WE WILL REBUILD
TO YOUR SPECIFICATIONS
OR BUILD NEW
AS REQUIRED

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EQUIPMENT CO., Inc.
30 CHURCH STREET
NEW YORK 7, N. Y.
PLANT: LANDISVILLE, PA.

CRANES

BOUGHT & SOLD

ENGINEERED TO YOUR REQUIREMENTS

Ornitz Equipment Corp.

Industrial Engineering Service
595 Bergen St. Brooklyn 38, N. Y.
NEvins 8-3566

IMMEDIATELY AVAILABLE

Because of Mill Consolidation

3 LEE WILSON RECTANGULAR BELL-TYPE ANNEALING FURNACES

atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils, they have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

NATIONAL MACHINERY EXCHANGE

126 Mott St. New York 13, N. Y.
CAnal 6-2470

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, resh, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

AMERICA'S LARGEST CRANE REBUILDING SERVICE

- ANY CRANE CAN BE MODERNIZED TO THE MOST EXACTING SPECIFICATIONS
- MECHANICAL & ELECTRICAL RECONDITIONING
- BRIDGE SPANS & HEADROOM ALTERED
- OVER 100 USED CRANES AVAILABLE
- MANUFACTURERS OF SilenTorque CRANES

POLLOCK INDUSTRIES, INC.

SOUTH KEIM STREET, POTTSTOWN, PA. FAculty 3-5500

Lou F. Kinderman

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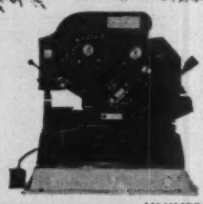

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New Economics of

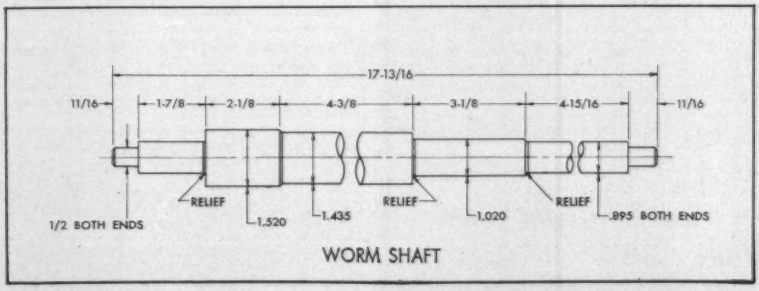
Big money being wasted because of traditional concepts in lathe utilization can now be saved.

The two jobs illustrated, taken from the same lathe department, prove that Barber-Colman's new 1610 "specialist" lathe—for turning, facing, and boring—is an economically sound machine concept for almost any shop.

Elimination of threading equipment—features which are not fully utilized on many lathes—produces an initial cost saving that can pay for a hydraulic tracer. The manufacturer of these parts (below) had plenty of threading capacity on older machines, so he elected to take a valuable hydraulic tracer for the cost of threading equipment he really didn't need.

Of course, there are many operating benefits to be gained. Spindle speed and power feed to both carriage and cross slide are infinitely variable. Ability to change both speeds and feeds without stopping the machine increases production on a great many jobs. Over-all result: A new kind of lathe specialization that minimizes capital investment for certain classes of work and opens a valuable opportunity to improve *total* machine utilization. Here are some of the specific results this manufacturer achieved.

The worm shaft was shifted from a turret lathe to the tracer-equipped Barber-Colman 1610 for facing, center drilling, and turning. Threads are now cut on a threading machine. This shift reduced total cutting time 32% and setup time 12% (including time on a threading machine). But time on a machine has to be reckoned in dollars, not minutes. Capital investment in the turret lathe is much more than for the 1610 lathe. What's more, the operator of the turret lathe is a Class

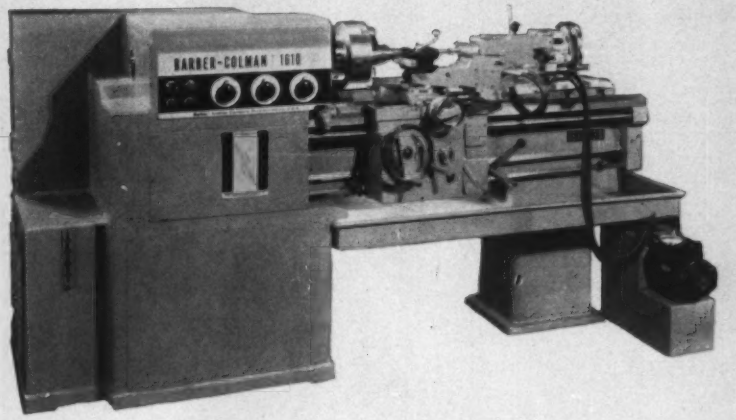


WORM SHAFT

MODERN MACHINE TOOLS MMT=PE PRODUCTION EFFICIENCY

The new 1610 lathe with tracer will be on display in the Barber-Colman Booth (No. 923) at the 1960 Machine Tool Exposition. It will confidently stand your most critical inspection.

Report shows how one Barber-Colman turning lathe initiated important methods improvements throughout a department.



"Specialist" Lathes

A, while the operator of the 1610 is Class B. And to further prove how ultimately practical this new lathe is, the Class B operator not only turns out more work, he also scraps fewer parts.

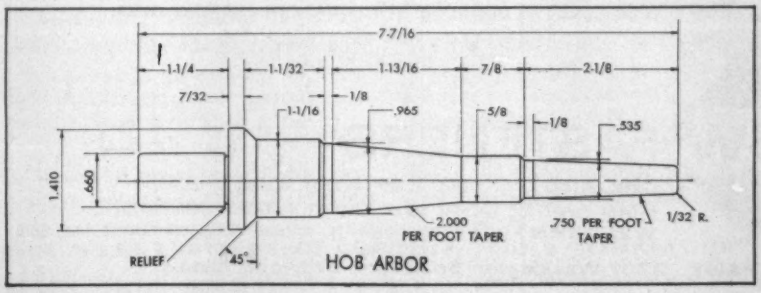
Utilization: tracer vs threading

Perhaps you are in the same position as this manufacturer: You have enough lathes to handle your threading requirements, but not sufficient tracing capacity. If so, a 1610 with tracer will be a particularly profitable investment for you. Take this hob arbor as an example.

By shifting the job from a conventional lathe without tracer to a tracer-equipped 1610, production was increased over 100%—from 1.5 to 3.3 pieces per hour. Setup time was reduced 40%. The important point is, this manufacturer is now using both his old lathes and his new machine more profitably. Here's why.

Maximum cutting speed on the old lathe was 632 rpm and feed was .0092" per revolution. On the 1610 FT, speed *ranges* from 900 to 1500 rpm and feed is .015" per revolution. A load meter allows the operator to obtain maximum production. In other words, there's quite a difference in capacity between an old lathe and a modern lathe. And since threading normally requires *slow speeds*, doesn't it make sense to thread on your older machines—and do turning, facing, and boring operations on this high-speed "specialist"? Why put low-speed work on a high-speed lathe?

The 1610, with 16" or 20" swing and 6½ hp motor, is a precision lathe capable of turning out toolroom quality work. If you are in the market for a new lathe, phone your Barber-Colman representative or write us for descriptive literature and complete specifications. Ask for Bulletin No. 9061-1.



Barber-Colman Company

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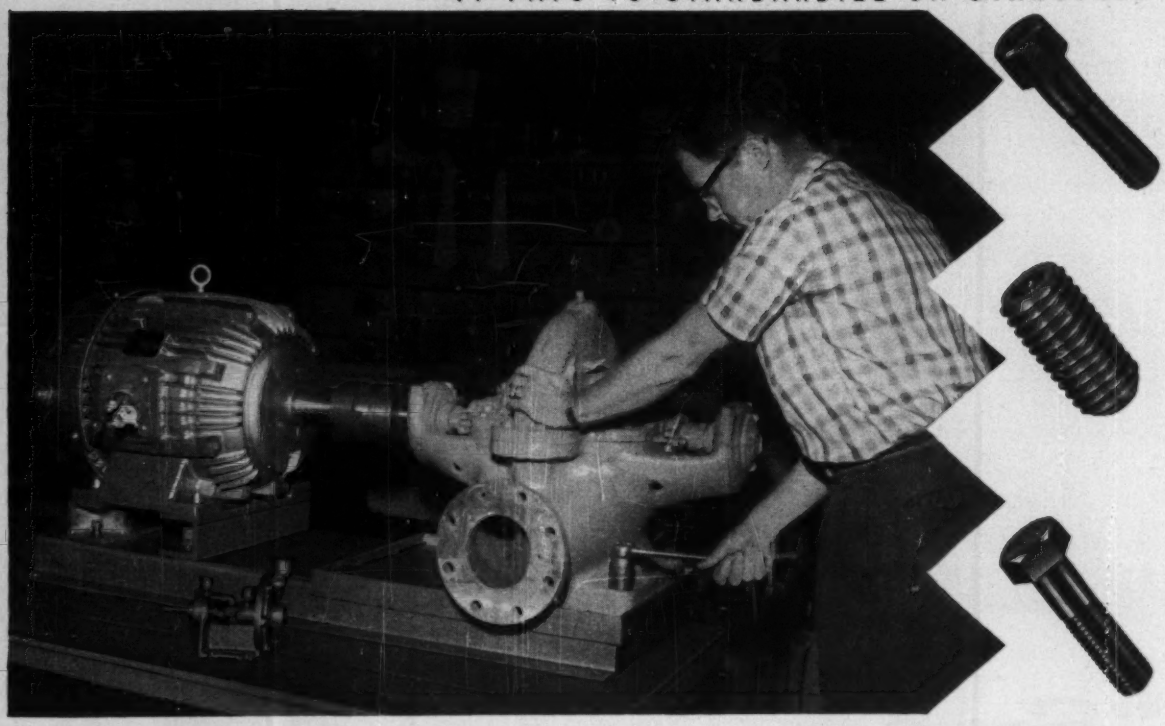

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Industrial leaders in every phase of industry are learning the wisdom of specifying Stanscrew for fasteners. A complete selection of over 5500 different types and sizes provides dependable, economical answers to the overwhelming majority of industrial requirements. Stanscrew's complete stocks at three convenient plants provide insurance against delivery interruptions. And, a really fast delivery policy avoids costly production interruptions in emergencies.

Call your local Stanscrew distributor today. He will be happy to arrange a prompt visit from the Stanscrew fastener specialist. Often his suggestions on assembly procedures, inventory adjustments or fastening techniques can cut your costs.

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Weirton Steel installs Wean Trimming Line for more efficient tinplate operation

Weirton Steel Company Division of National Steel Corporation recently installed this new Wean side trimming line to increase efficiency in its tinning operations. After the plate has been tempered to customer specifications, it is moved to the Wean tension-type line for final trimming. This advance preparation of coils provides larger, evenly wound coils for the electrolytic tinning line.

The Wean side trimming line has a maximum speed of 4,000 feet per minute and is able to handle 60,000 pound coils 18 to 45 inches wide. Inside diameter of the coils is 16½ inches; maximum outside diameter is 85 inches. Many new design features are incorporated to side-trim coil to accurate widths at high speed.

To improve the efficiency of your tinplate production, call upon a Wean representative to help you plan your requirements. Wean's "creative engineering" has played a vital role in the development of over 75% of the continuous tinplate processing lines in operation today.

THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO

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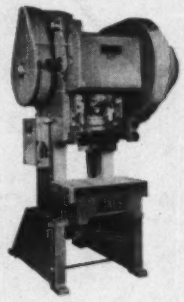
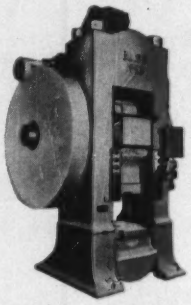
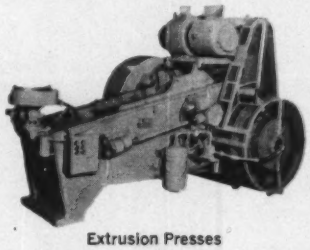


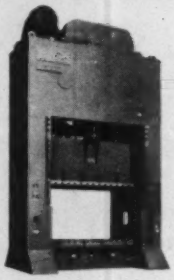
Inclinable Presses
single crank and double crank



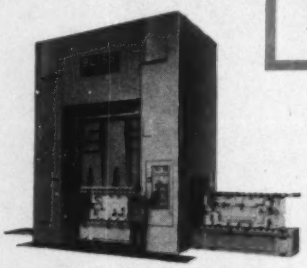
Knuckle Joint Presses



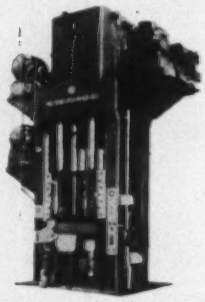
Extrusion Presses



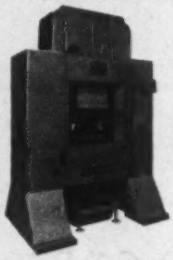
Eccentric Presses



Rolling Bolster Presses



Hydro-Dynamic Presses



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